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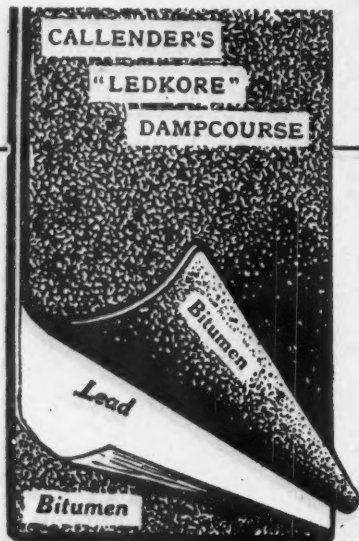
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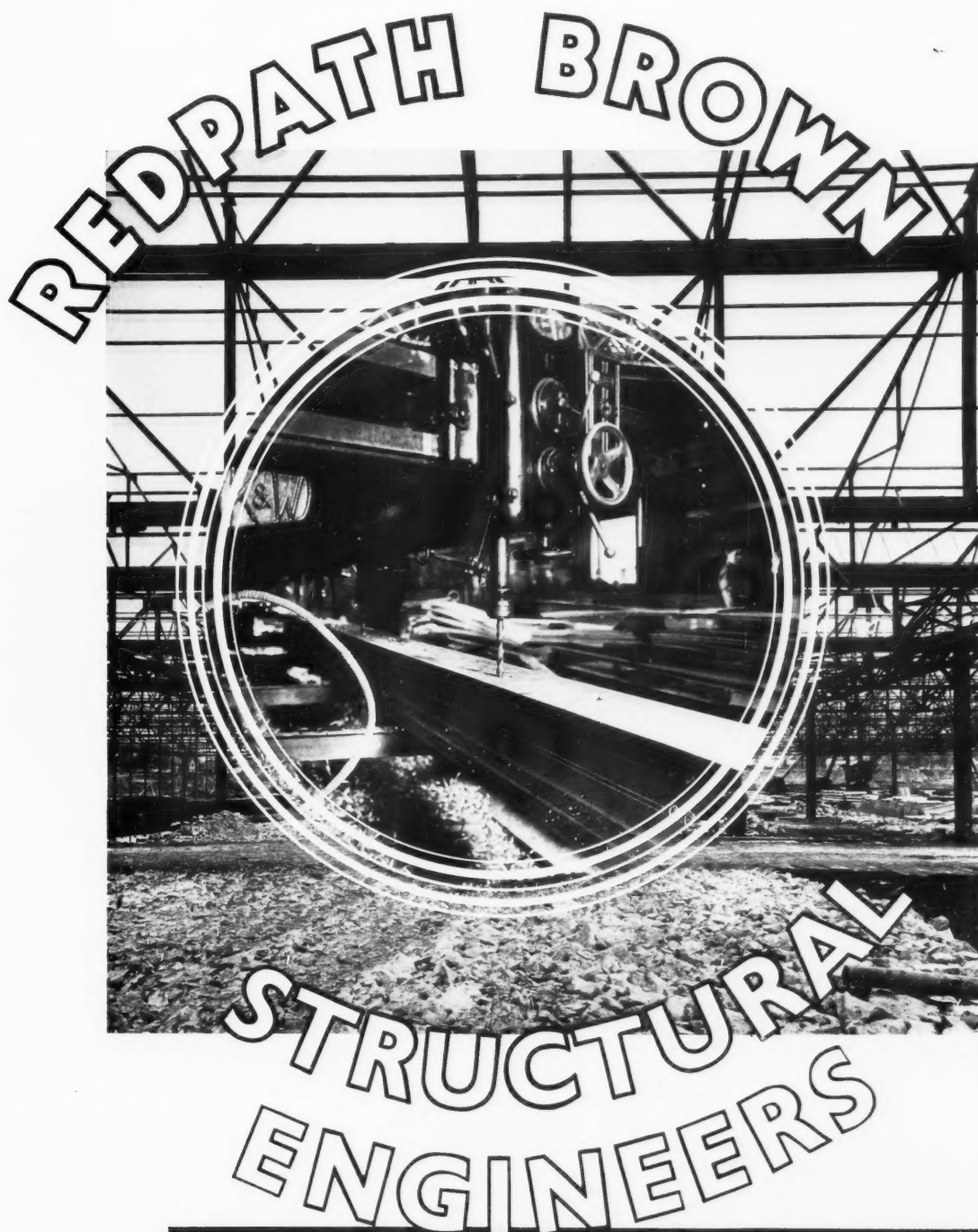
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VOL. LXXXVIII No. 524

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### Prepaid Subscription Rates

United Kingdom, £1 5 0 per annum, post free. U.S.A., \$8.00 per annum, post free. Elsewhere Abroad, £1 5 0 per annum, post free. Cheques and Postal Orders should be made payable to THE ARCHITECTURAL PRESS LTD., and crossed Westminster Bank, Caxton House Branch.

Subscribers to THE ARCHITECTURAL REVIEW can have their volumes bound complete with Index, in cloth cases, at a cost of 10s. each, or cases can be supplied separately at 4s. 6d. each.

An index is issued every six months, covering the months of January to June and July to December, and can be obtained, without charge, on application to the Publishers, 45 The Avenue, Cheam, Surrey.

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To help in the economy of paper, we are publishing in this advertisement a series of notes which would normally have been issued in Booklet form.

## THE TRUTH ABOUT GLASS IN A.R.P.

**G**LASS has a traditional and undeserved reputation for fragility, but since the last war it has changed its character, and has become recognised as a structural material in building. Glass reinforced with wire, glass bricks, glass lenses, and toughened glass have come into common use in modern building technique, and although glass is possibly the last thing most people would think of in connection with A.R.P. work, that is only because their thinking about the material has been influenced by old associations.

### Glass in War-time

Now the position of glass in the protective measures advocated for domestic and industrial buildings has been dealt with in various official publications, but amendments and subsequent experiments have frequently invalidated or modified the original instructions. But before commenting upon these official statements, or attempting to clarify the occasional ambiguities that occur, it is desirable briefly to describe the principal forms of glass that can be used in war-time.

#### 1. "ARMOURPLATE" GLASS

"Armourplate" Glass has special powers of resistance to shock and impact, and to high temperatures. It is produced in thicknesses ranging from  $\frac{3}{16}$  in. to  $1\frac{1}{2}$  in. Its resistance to severe impact is five to six times that of ordinary Polished Plate Glass of the same thickness.

When broken, this glass disintegrates into innumerable fragments, neither large nor sharp enough to cause serious injury. It does not splinter, and while retaining the transparency, lustre and flatness of ordinary Polished Plate Glass it does not discolour under any conditions. In official tests with 500-1,000-lb. bombs bursting at distances of 50 ft. or more, A.R.P. Handbook No. 5 "Structural Defence" states:—"1-in. toughened glass,\* solid or hollow building lenses, or glass bricks set in concrete frames are highly resistant to blast."

#### 2. "ARMOURLIGHT" LENSES

Toughened Lenses have been specially manufactured for fixing into concrete. They can be used for a flat roof, or, in the case of vertical walls, by building them up in the form of a precast panel. These lenses are specially toughened and provide approximately twenty times greater resistance to impact than a similar lens in ordinary annealed glass. They will also withstand great thermal shock. Toughened Lenses have the same characteristic break as

"Armourplate" glass, and in the event of a lens breaking it will exert a lateral thrust upon the concrete in which it is fixed and remain firmly in position. Official tests have proved that they are highly resistant to blast pressure. In addition they provide full protection against an incendiary bomb burning on the surface of the lens.

#### 3. INSULIGHT GLASS BRICKS

These are hollow glass units made in two halves and sealed together, and are designed for use in vertical walls. Glass Bricks are laid in the same way as ordinary bricks but being a non-load-bearing unit they should be regarded as a panel within a structure. They are highly resistant to blast pressure, and, as a result of a test at the Building Research Station Fire Testing Station they have been certified as having a Grade D Fire Resistance.

#### 4. WIRED GLASS

This is a well-known type of glass but its efficiency, especially in war-time, is not perhaps fully appreciated. There have been certain references in A.R.P. publications on the effectiveness of wire netting placed over windows as a measure of protection, but compare this with a window having the wire netting embedded in the glass. In the former case it is highly probable the blast will break the glass, the fragments become dislodged, and the wire netting may remain in the opening, resulting in the window opening being exposed to the weather.

Wired reinforced glass is highly resistant to blast pressure, and although the glass may be cracked, the wire holds the pieces together as a complete panel and remains in the window opening. The explosion in the neighbourhood of St. Paul's Cathedral just before the war began demonstrated the effectiveness of wired glass. It was observed that one building in close proximity to the explosion still retained its windows, which were of wired glass, while the windows of adjoining buildings were completely smashed and the glass shattered.

A.R.P. Memo No. 12 *Aims in Window Protection* reads:

"Assuming that glass is likely to be broken, window protection should be devised:

- (a) To prevent damage from flying pieces of glass.
- (b) To exclude weather (wind and rain).
- (c) To act as obscuration in certain cases.

Wired Glass will provide (a) and (b). When used in conjunction with

shutters it will also provide (c) inasmuch as the glass remains in the frame even though cracked, thus permitting the shutters still to be used during black-out hours, with natural light still available in the day-time.

Wire reinforced glass is a fire retardative and will prevent the spread of fire. It has been approved by the British Fire Prevention Committee's standards — Specification B. The London County Council has approved its use as a fire-resisting material.

### The Place of Glass in War-time Building

The latest publication on the subject of building technique in war-time is issued by the Building Research Station of the Department of Scientific and Industrial Research. Its title is "War-time Building Bulletin No. 1," and it is issued by H.M. Stationery Office. We quote therefrom the following statements:

*"It should be noted that it is considered desirable to use wired glass whenever possible, since this has been found, by experiment, to offer high resistance to blast from a nearby high explosive bomb."*

(Section 2, A.R.P. Considerations—Structural Treatment of Glazing, Page 4.)

And again, dealing with the problem of the black-out, the following statement is made:

*"No lightweight external shutter system can be expected to give more than very slight protection to the glazing behind. Therefore problems of weatherproof and lightproof protection to glazing in the designs here reproduced appear to be met best by a combination of wired glass in a vertical glazing system and a suitable form of blind or shutter behind. This is the method which has been followed."*

(Section 4, Page 6.)

### Conclusion

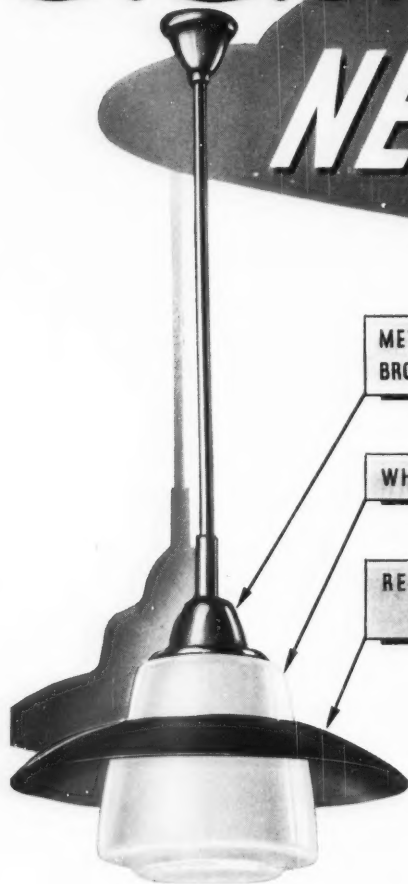
From the foregoing notes and quotations it may be reasonably concluded that glass has outlived the disabilities normally ascribed to it, and that the capacity of glass bricks and lenses and wired glass to meet the abnormal conditions of contemporary warfare has been not only established, but officially endorsed. Many tests on the resisting powers of various forms of glass have been carried out by Pilkington Brothers Limited, and published details of such tests will be sent on application.

The Technical Department of Pilkington Brothers Limited at St. Helens, Lancashire, is always available for consultation on the use of glass in A.R.P. and in any form of structural work.

\* The toughened glass referred to is "ARMOURPLATE."

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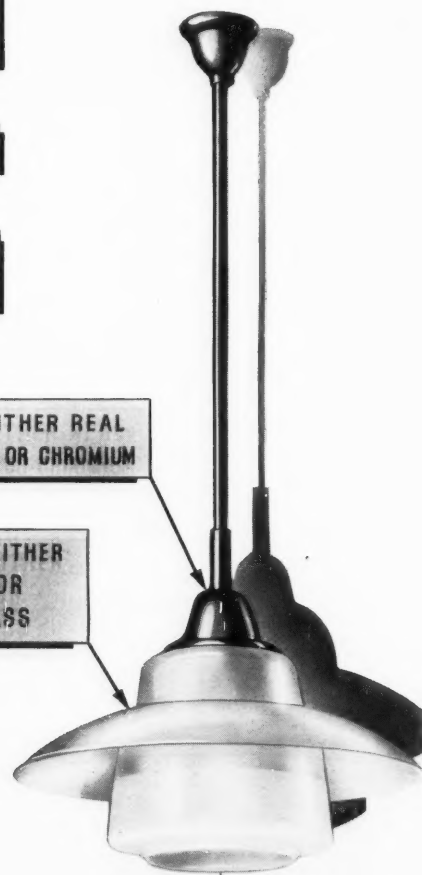
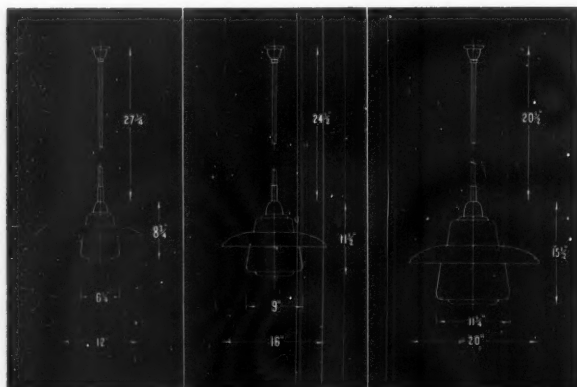


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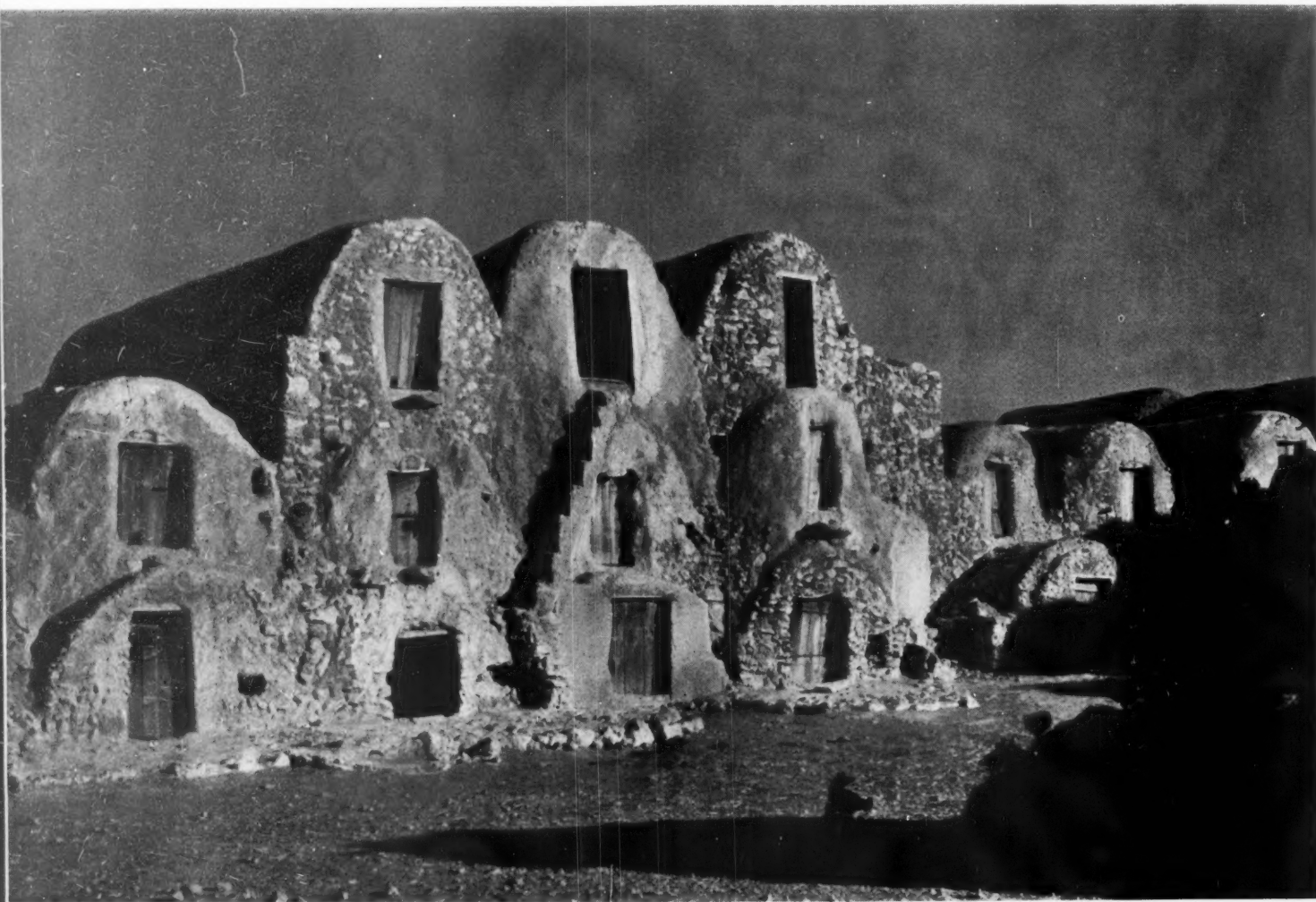
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In Arab villages of Southern Tunis family expansion is catered for by each generation building a new row of oven-like cellular dwellings on top of those occupied by its parents, producing a unit housing system not unlike that advocated under the most modern systems of flexible planning. The houses are built of stone, and the upper

ones are reached by external staircases running across the face of the lower ones. These examples are in the village of Metameur about 250 miles south of Tunis. A note on the cellular Arab dwellings of this type, with further illustrations, appears on pages 28 and 29 of this issue.

## UNIT PLANNING IN PRIMITIVE ARCHITECTURE

# Architecture and Thomas Hardy

the centenary of whose birth is being celebrated this summer

By Geoffrey Grigson

WHAT is the common way of regarding Thomas Hardy, whose birth is commemorated this year, and whose life stretched across the nineteenth century to our own, through war and war? The professionals—Henry James, for instance—have always patronized him a bit. Not quite an author, not quite a poet, not quite an artist; and also, no doubt, not quite a gentleman. Not quite Browning, not quite Mr. T. S. Eliot. The man who wrote "*When I set out for Lyonesse*" and "*Only a man harrowing clods*." Not quite a peasant, but nearly. And he said that the *Odyssey* or the *Iliad* was "in the *Marmion* class." I doubt if Mr. Clive Bell would think of Hardy and Cézanne together. I doubt if many of those who read, or advise us to read, *The Dynasts* at the present time, go far deeper than the topicality of Napoleon's threat to invade England or the resemblance between Hitler and Napoleon as two products of the Unseen Forces and the interplay of the Eternal Abstractions.

Hardy was our prelude. He was not (nor was Cézanne) an old, lumpy, honest and simple peasant; but a complicated, cultured, resolute, narrow, sensitive man of the new professional classes of the nineteenth century; his profession, that is his preliminary profession, being architecture. He appeared simple, because his effects were reduced to the apparent simplicity of bone. He was a man without ambition, able to conceive ideas, roll them round, feed them, and mature them slowly through a very long time. He was penetrated by natural objects and phenomena, which he felt thoroughly as themselves, and, in one act, as images of the knot of human life. As he saw one thing, he saw another: the little old simpleton saw the affectation of his superior contemporaries (Walter Pater's manner "is that of one carrying weighty ideas without spilling them"); but he did not wish to seem a depreciator and so he destroyed nearly all the notes of this kind which he had made.

It seems to me facile to claim that the profession in which a man is bred—a passive act—must be related to the profession in which he discovers himself. The link may be there, but it can seldom be proved, and it belongs usually to that order of unscientific and sentimental statements about descent which live in the first chapters of biography. An anthologist, for example, has just detected a strain of Celtic mysticism in the poet Robert Stephen Hawker, though he was English by descent and training, *because he lived in Cornwall*. So I am sure it is wrong to say that such and such blood flowed in Hardy's writing, because he was an architect. Architecture was not vitally prominent in Hardy's work, certainly not in Hardy's imagination. How could it be? Architecture is a poor art—a poor professional

art—for a strong sense of life. How can a young architect give form, except in drawings, to the urgencies of his feeling? I presume that architecture must be a profession of competent channels—competent hacks, if you like—through whom the already shaped ideas are put into stone, brick, or steel. The ideas change a little between entering and leaving the channel, but the architects who feel the time, and feel history and first shape the ideas, are very few. They are the rare, widely separated men of genius, fortunate in the coincidence of their own powers and a receptive time in which many buildings are demanded to fill some new social need. Since the means of architectural realization are costly, communal, and non-individual, so great an urgency as Thomas Hardy's in his youth must have broken out elsewhere unless there had been some fluke of favourable circumstance. And, as it was, Hardy showed little architectural talent, either as a draughtsman or a designer. He acquiesced in architecture, and was pushed into it by his father, who was a builder, and had worked for Mr. John Hicks, the Dorchester architect and church restorer by whom Hardy was first instructed. "Hardy was a born bookworm, that and that alone was unchanging in him; he had sometimes, too, wished to enter the Church, but he cheerfully agreed to go to Mr. Hicks's."

So much for that. And now it is established that Hardy and architecture came accidentally together (much as a lawyer's son may become a lawyer and then a landscape painter), it will be safe to say how his practice of architecture tinged, for example, his poetry; and to affirm that if Hardy's architectural talent was mediocre, he had that sense of human history in physical images which architecture needs and which so few architects ever possess.

Hardy worked chiefly on church restoration, vicarages and rectories, and schools for the London School Board. He stayed for some time with Mr. Hicks, sketching and surveying churches in the West of England, and destroying (to his later sorrow) much medieval, Jacobean and Georgian detail. He came to London in 1862, and after getting politeness but no employment from Benjamin Ferrey, Pugin's pupil and biographer, he found a job with Arthur Blomfield. For ten years Hardy wavered between architecture and letters. Sir Arthur Blomfield—he became one of mediocrity's knights—was congenial to work with. They sang hymns together, when there was little to do. Hardy was continually writing poems—to Blomfield's knowledge—and even began to turn *Ecclesiastes* in Spenserian stanzas. He drew funny pictures on the Adam mantelpiece in the offices in the Adelphi. He did strange jobs—superintending the removal of the tombs and corpses and skeletons of Old

St. Pancras churchyard for the Midland Railway, for example. Behind a hoarding, by gas flares, the work went on all night, the loose skeletons being carried on boards. He won the R.I.B.A. silver medal in 1862 with an essay on Architectural Polychromy (the essay was presumably not good enough to be printed in the transactions of the Institute, and is now lost). He paid much attention to pictures, he began to write novels. He went back to Dorchester and helped Mr. Hicks. He helped a Weymouth architect who took over Hicks's practice—and this brought him a wife when he went down to advise on the restoration of St. Juliot Church in North Cornwall. His wife, Miss Emma Gifford, opened the door to him in the rectory; and so one could say that architecture introduced him to some of his happiest and bitterest times and led to such poems as *Lyonesse* (written—and how that knowledge revives it!—on the way back from Cornwall) and, forty years later, to the deeply pathetic emotional retrospect, *After A Journey*. In 1872 he was designing schools with Professor Roger Smith, but *Under The Greenwood Tree* had now been written and his own impulse and the presence of Miss Gifford were pushing him absolutely away into literature.

At Blomfield's his not being ambitious was observed; and he recorded in his old age how his mind was then beginning to fill with poetry: "A sense of the truth of poetry, of its supreme place in literature, had awakened itself in me. At the risk of ruining all my worldly prospects I dabbled in it . . . was forced out of it. . . . It came back upon me. . . . All was of the nature of being led by a mood, without foresight or regard to whither it led."

"Churchy" was how Hardy described himself; but Hardy's churchiness was that of a man involved in humanity; who believed that everything should be done to ease "mortals' progress through a world not worthy of them." "I have been looking for God for fifty years," he wrote down in 1890, "I think if he had existed I should have discovered him." Churches were to Hardy places sacred to tragedy rather than to God, where an answer had been pitifully looked for and never found. So it is ironic from one angle, and right from another, that he tidied up so many churches in the interests of a creed he believed to be no longer of use. If he had wished to build and set up in practice, it is not easy to see anything he could have built out of his full and peculiar churchy heart in the fifty years after 1870. His churches to his God, a Cause neither moral nor immoral, loveless and hateless, are something for which no one would have provided the stone and cement. Yet, I repeat, Hardy began where the rare and true architect should begin—with man, not first with those forms which sprout from man, or with his clothes, however



expressive they may be. The accidentals of his union with architecture brought him not only into the happy and sad experiences of his marriage ("the ultimate aim of the poet," he wrote down from Leslie Stephen, "should be to touch our hearts by showing his own"), gave him not only persons to write about (such as the church-restorer in *A Pair of Blue Eyes* or George Somerset in *The Laodicean*), but forced him into the company of vital images. They brought him into the yet intolerable London of 1862, the cruel capital of Baal which Dostoevsky saw in that year or the next,\* the prediction from the Apocalypse, with the fish-flares of gas, the drunkenness, evident wealth, evident poverty, the Haymarket full of whores, and the City still drained into cesspits built after the Great Fire, a ten foot bank of human droppings piling up where the river Lea emerged at Barking Creek, and a stink from the same substance in the river pervading the Houses of Parliament. And so Hardy observed year after year the false clean-up—the cleansing of the Lea and the accumulation of filth in the human heart, breaking into wars; the black comparison between material growth and moral regression on which he speculated so much in so many poems.

Herein, with his power of sight and vision, is rooted Thomas Hardy's human sensibility; by which the pilers-up of Maiden Castle or the Thames-side business blocks are hardly possessed. Whether he had that architectural sensibility in a more restricted way—that feeling for the historicity and humanity of form and ornament and the fitting of building into landscape, which is commoner among amateurs than architects, I doubt, although I could quote such remarks as "the ashlar backyards of Bath have more dignity than any brick front in Europe." Hardy digs rather for the general root of all buildings. He goes to St. Marks, he is anti-Ruskin, he finds it squat, oriental, barbaric, built on "weak, flexuous, constructional lines." He records chiefly that the floor "of every colour and rich device, is worn into undulations by the infinite multitudes of feet that have trodden it." He goes to Salisbury into the Close, at night, "walked to the West front and watched the moonlight creep round upon the statuary of the façade—stroking tentatively and then more firmly the prophets, the martyrs, the bishops, the kings and the queens." He goes round Westminster Abbey by lantern at midnight, or into Wimborne Minster:

*How smartly the quarters of the hour march by  
That the jack-o'-clock never forgets;  
Ding-dong; and before I have traced a cusp's eye,  
Or got the true twist of the ogee over,  
A double ding-dong ricochets.*

*Just so did he clang here before I came,  
And so will he clang when I'm gone  
Through the Minster's cavernous hollows—the same  
Tale of hours never more to be will he deliver  
To the speechless midnight and dawn.*

\* In "Winter Notes on My Summer Impressions," translated in the *European Quarterly* No. 2, August 1934.

*I grow to conceive it a call to ghosts,  
Whose mould lies below and around.  
Yes; the neat "Come, come," draws them out  
from their posts,  
And they gather, and one shade appears, and another,  
As the eve-damps creep from the ground . . .*

Always, you see, a church, always a meeting place of the dead, the living, and the unborn. On architecture as an art, and as an art of the age through which he was living, I do not know that Hardy pronounced anything peculiar or deep. He was much impressed by the Englishness of the Perpendicular (read "The Abbey Mason" in *Satires of Circumstances*). He discerned that architecture and poetry resembled each other, "both arts having to carry a rational content inside their artistic form"; and perhaps it is truly said that his poems have a precise Gothic intricacy, even on the page. But it is curious—curiously instructive—that he interprets his period more certainly when he thinks of painting, than when he thinks of his own profession. "I am more interested," he said, "in the high ideas of a feeble executant than in the high execution of a feeble thinker." He preferred Zurbarán to Velázquez. He put down in 1886 "my art is to intensify the expression of things, as is done by Crivelli, Bellini, etc., so that the heart and inner meaning is made vividly visible." More to be remarked—one thinks of Balzac's *Chef d'œuvre Inconnu* or justly again of Cézanne—is the statement he made to himself in January 1887:

"After looking at the landscape ascribed to Bonington in our drawing-room I feel that Nature is played out as a Beauty, but not as a mystery. I don't want to see landscapes i.e. scenic paintings of them, because I don't want to see the original realities—as optical effects, that is. I want to see the deeper reality underlying the scenic, the expression of what are sometimes called abstract imaginings.

The 'simply natural' is interesting no longer. The much decried, mad, late-Turner rendering is now necessary to create my interest. The exact truth as to material fact ceases to be of importance in art—it is a student's style—the style of a period when the mind is serene and unawakened to the tragical mysteries of life; when it does not bring anything to the object that coalesces with and translates the qualities that are already there—half hidden it may be—and the two united are pictured as the All."

That is the best gloss on Hardy's own aims in his poetry, in which, and not in his novels, he has given us the most to feed upon. "A skeleton—the one used in these lectures—is hung up inside the window. We face it as we sit. Outside the band is playing, and the children are dancing. I can see their little figures through the window past the skeleton dangling in front"—there he is. I understand, I think, why Mr. Eliot, setting Yeats beside Hardy, believes Hardy to be obviously a minor poet. Hardy and Eliot interpret life very differently. The churchiness of each is differently composed; and Yeats is a pagan, but a purer writer, less crinkle-crinkle in his substance. Hardy works more by seeing, less by

the imagination of words. The scope of his sensuality is limited, and he repeats himself with too little variation. But I also understand why it is that poetry in English cannot avoid Hardy any more than architecture can avoid such a man as C. R. Macintosh. He recorded "impressions, not convictions," was an artist, not a moralist or philosopher, and observed at once the language, the age, and the world. "Style—consider the Wordsworthian dictum (the more perfectly the natural object is reproduced, the more truly poetic the picture). This reproduction is achieved by seeing into the heart of a thing (as rain, wind, for instance) . . ." He admired the realism of Crabbe, and narrow as he may have been, he brought back a selective realism, a truth, a congruence, an honesty. In 1909, in answer to an enquiry from Berlin: "We call our age an age of Freedom. Yet Freedom under her incubus of armaments, territorial ambitions smugly disguised as patriotism, superstitions, conventions of every sort, is of such stunted proportions in this her so-called time, that the human race is likely to be extinct before Freedom arrives at maturity." In 1920, when he was 79: "January 19th Coming back from Talbothays by West Stafford Cross I saw Orion upside down in a pool of water under an oak." Here, then, are two observations, and I reverence Hardy as an observer, one who discerned with terrible accuracy the intensification of evil and was glum and numb less, on the whole, over individuals than over the events which victimize them and kick them on through a world to which they are superior.

I recall now a letter written by Rainer Maria Rilke in the intensity of the last war:

" . . . no longer can the measure of the single heart be applied, yet at other times it was the union of earth and sky and of all distances and depths. What, at other times was the cry of a drowning man; and even if it was the village idiot who reached up from the water with a cry grown suddenly clearer, everything rushed towards him and was on his side and against the disaster, and the quickest man risked his life for him . . . people cling to the war like misers with all the weight of their heavy consciences. It is a human bungling, just as everything in the last decades was human bungling, bad work, profiteering, except for a few painful voices and figures, except for a few warning prophets, except for a few zealots who held to their own hearts, which stood contrary to the stream. Rodin, how often, how everlastingly did he reiterate words of disapproval and suspicion against the course of things. It was too much for me, I took it for exhaustion and yet it was judgement. And Cézanne, when they told him of outside affairs, in the quiet streets of Aix, he could burst out and shriek at his companion: 'Le monde, c'est terrible.' One thinks of him like a prophet and one longs for another to cry and howl so,—but they have all gone, the old men who might have had the power to weep now before the peoples of the world."

Thomas Hardy was one of them. How bitterly appropriate that the centenary of his birth should fall to be celebrated in the year of the no less terrifying and even more immense and terrible war in Europe.





## CURRENT ARCHITECTURE

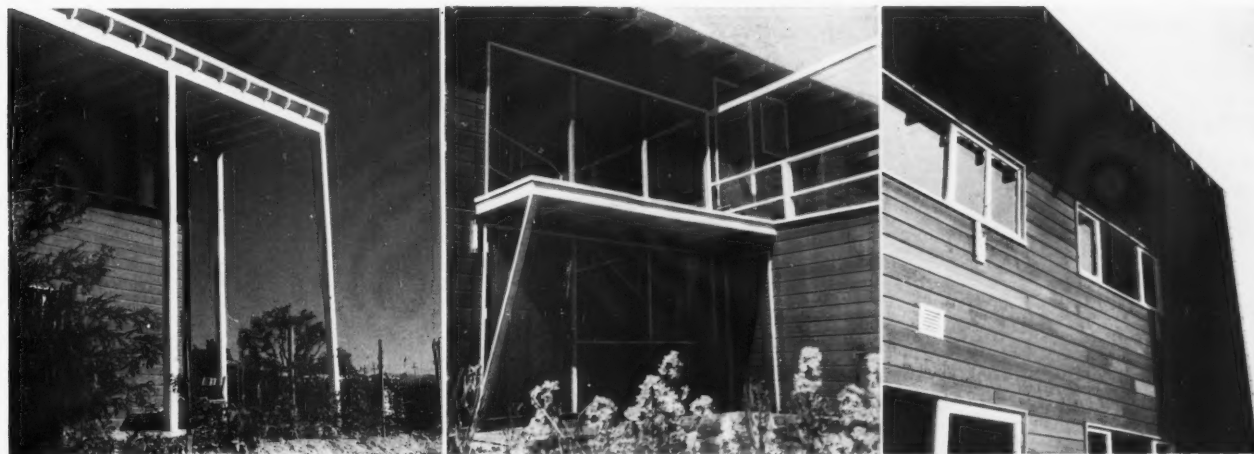
### HOUSES, 1 JOHN EKIN DINWIDDIE

**SITE AND PLANNING** At Menlo Park, California. The house is set well back from the road at an angle of approximately 45 degrees and protected from it by a row of trees. The living- and dining-room is planned on the south-west and north-west-sides with French windows leading out on to terraces. There is a large garage with storage accommodation on the north-east with a flat sun terrace above.

1, the south-west elevation. 2, the service entrance from the south. The natural colour of the wood is well contrasted with the white-painted soffit carried round as a shelter to the service entrance. 3, the main entrance with a side entrance to the garage on the right. 4, a detail of the south-east corner.



SITE PLAN



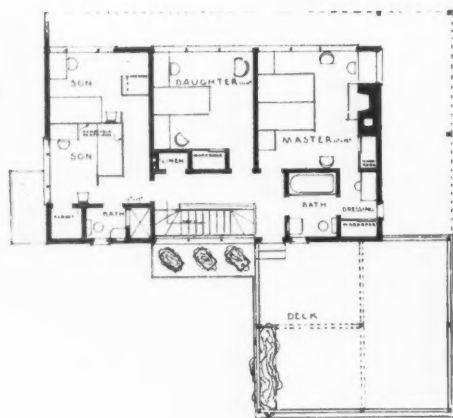
2

3

4

# HOUSES, 1

JOHN EKin DINWIDDIE



FIRST FLOOR PLAN



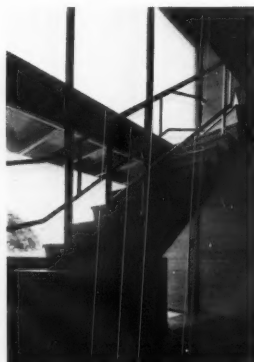
GROUND FLOOR PLAN



5

5, the dining side of the living-room looking towards the French windows on the west side of the house. 6, the staircase which runs up over the front entrance.

**CONSTRUCTION AND FINISHES** The house has a wood frame faced with redwood siding and lined with an insulation board. The roof is finished with a tar and gravel mixture. The walls in the interior are flush panelled with plywood downstairs with a Philippine mahogany veneer, and are papered upstairs. All ceilings are V-jointed insulation board. The house is equipped with central heating and includes two bathrooms.



6

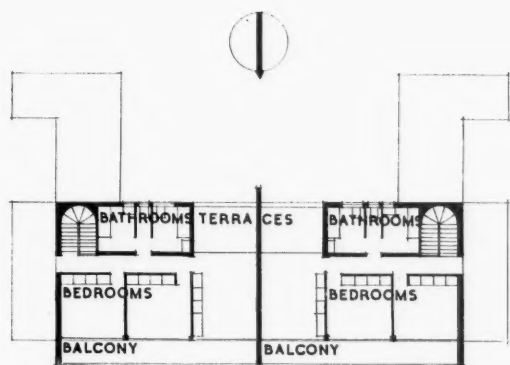
# HOUSES, 2

ANDREW BOYD

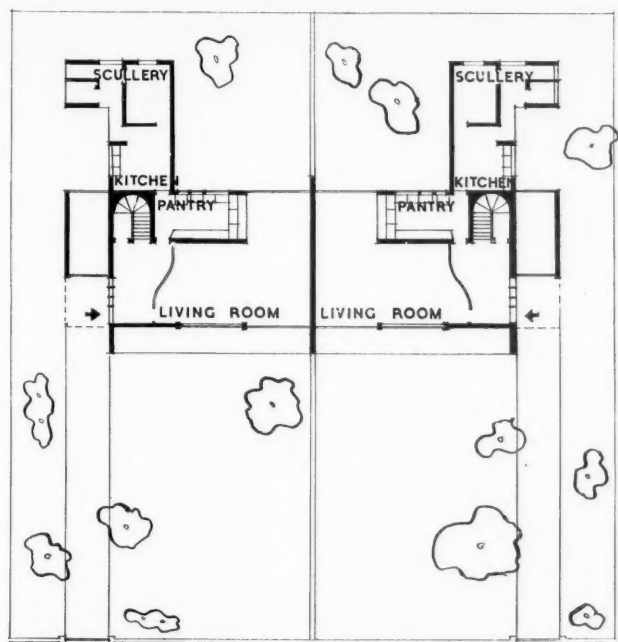
**SITE AND PLANNING** Colombo, Ceylon. The object was to provide on a site of one-third of an acre, with houses on either side and access to the road from the north only, two three-bedroomed houses with the maximum garden space, coolness and privacy. The orientation (in this latitude) north and south avoids the excessively hot sun and faces the two prevailing winds, north-east and south-west. A two-slope roof with vertical surface between gives a continuous line of ventilation above bedrooms, and elsewhere there is through ventilation in all main rooms.



1, a detail of the balcony outside the bedrooms. 2 and 3, the houses seen from the road. The rendering is white with external woodwork grey and front doors Chinese red.



FIRST FLOOR PLAN



GROUND FLOOR PLAN

**CONSTRUCTION AND FINISHES** 14-in. brick side walls and partition walls. The front wall consists of reinforced concrete ribs with panels of 9 in. brick between windows. The exterior rendering is a lime and cement undercoat with a finishing coat of lime. Ceilings are of insulation board. The living-room has a floor of buff-coloured cement and the bedrooms have teak boards. Windows and louvres are teak and the flush doors are hardboard sheets fixed over skeleton frames.



2



3





4



SECTION

4, looking from the south. The overhang of roof and balcony shade the cool stone terrace. Servants' quarters are in a separate block seen on the left. The section on the left shows the double slope roof with ventilation louvres between, through which cross ventilation is given to the main rooms.

## HOUSES, 2

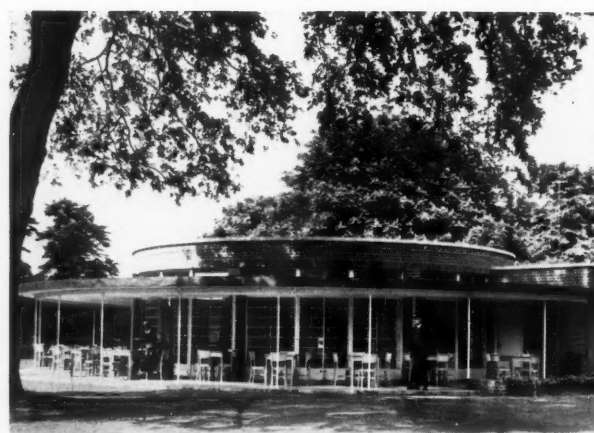
ANDREW BOYD

## CAFÉS

H. A. ROWBOTHAM, L.C.C. PARKS DEPT.

**SITE** Battersea Park, London : on the east side of the park, beside the lake and the deer enclosure. It is a partly open-air café and is part of the programme for improving the amenities of the parks under their jurisdiction which the Parks Department of the London County Council is carrying out under the chairmanship of Mrs. Hugh Dalton.

1, the café from the direction of the lake, showing the lawn in the foreground on which tables can be placed to increase the outdoor accommodation.

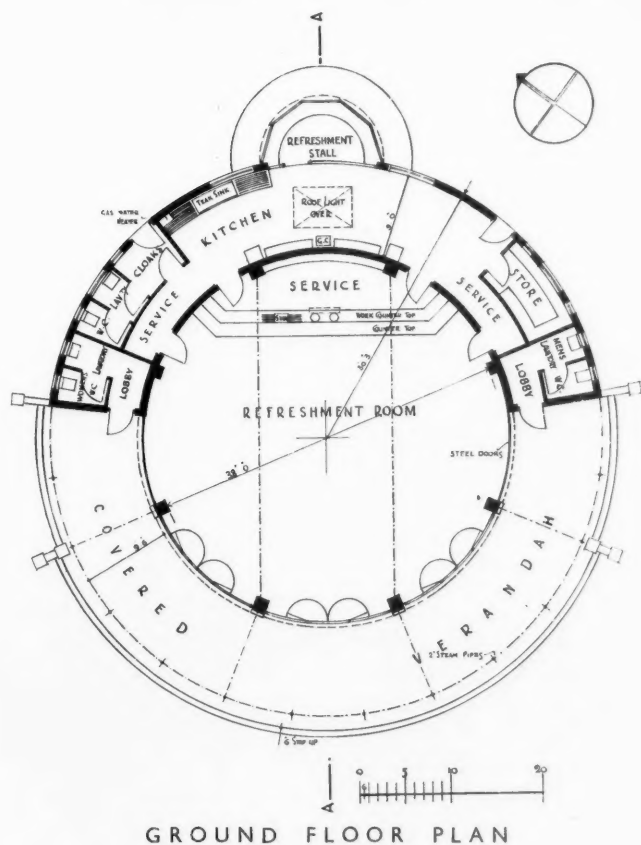




**PLANNING** The indoor café is a circular room about 40 ft. in diameter with a service counter at one side. Half the opposite side consists of windows from floor to ceiling commanding views to the south-west over the lake. Outside the windows is a covered terrace, running round half the circumference of the building, the equivalent space around the other half being taken up by public lavatories and by the kitchen and service space. On the north-east side projects a small refreshment stall, for selling sweets, etc. to children, planned to be independent of the main café.

#### CONSTRUCTION AND MATERIALS

Construction is brick, with red brick external walls and internal walls and partitions of sand-lime bricks. There are concrete sub-floors with a finish of rubber in the café and composition in the kitchen and lavatories. Windows are all of metal. The canopy of the terrace is supported on steel columns. The interior of the café is plastered and painted cream. The counter top and front are brick-red linoleum and the service doors either side glossy black. Furniture is natural cellulosid wood.



2

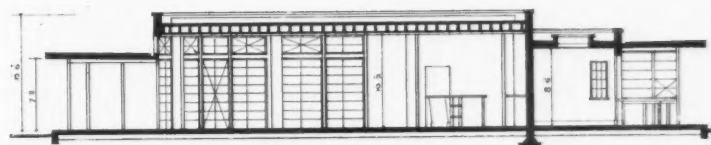
2, the café terrace, showing the slender steel columns, painted primrose yellow, designed to avoid obstructing the fine view across the lake. 3 and 4, the other side of the building, that furthest from the lake, showing the small refreshment stall which is chiefly intended for sales to children. The door shown in 4 is the general staff and goods entrance.



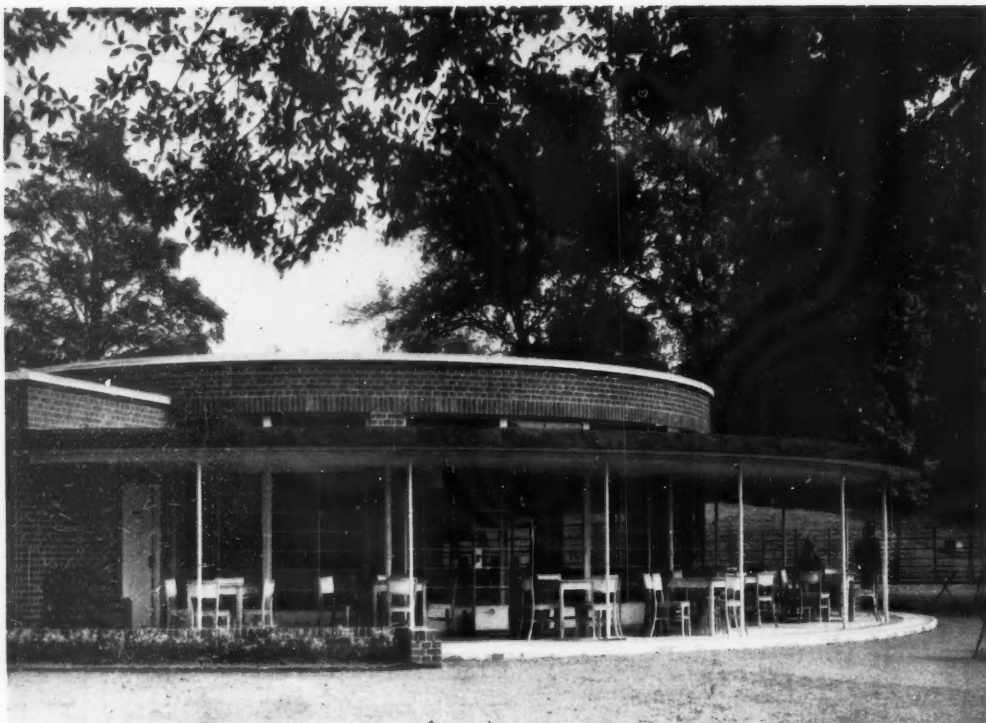
3



4



CROSS SECTION ON A—A.



5



6

The café is well planned to take advantage of an ideal site, as the south-west aspect, which has been allotted to the terrace, 5, also commands a beautiful view across the lake, shown in 6, which is taken from the interior. The view centres on the waterfall on the opposite shore, and also on a new and very effective piece of landscaping which forms one of a number of improvements which are being carried out in this and other L.C.C. parks by

Mr. A. R. Mawson, the Chief Officer. Planting of a more open and park-like character is being substituted for Victorian shrubberies. Another improvement is the standardization of good furniture designs. In the foreground in 6 can be seen the specially designed café tables and chairs in natural wood, cellulosed, the tables having linoleum tops; and in the background the new design for park chairs, in green-painted iron, made to stack.

## C A F É S

H. A. ROWBOTHAM, L. C. C. PARKS DEPT.

# Wall Textures

A LOCAL STUDY By Frederick Gibberd



Variety of texture and material in close juxtaposition: a row of houses at the top of the High Street at Lewes, showing stucco, flint and painted surfaces

A generation or so ago the traditional building crafts were a common subject of architectural study. But a revolution intervened and we found ourselves ignoring the craftsmanship aspect of traditional building as part of the action of turning our backs on the stylistic pedantry into which tradition had become debased. But the modern revolution has now done its job in the sense that it has reorientated architecture towards its essentials. It has enabled us once more to look at traditional things, such as the various effects that are obtained with local materials, dealt with in this article, for their own sake.

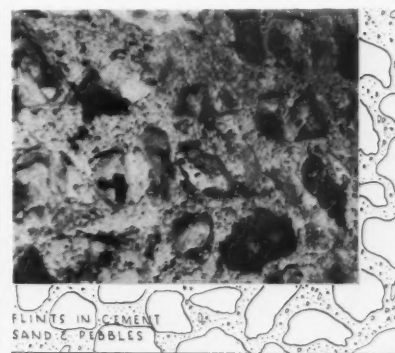
THE first quality we associate with texture is the tactile one of roughness of surface. Roughness or smoothness are purely arbitrary terms and until some enthusiast classifies degrees of roughness by relating them to some natural substance, such as red sandstone as hewn from the bed, the quality will remain a comparative one, and gradations remain undefined. A second and more important quality is that of structure. Two materials having identical tactile values, but with different arrangement of fibres or crystals, may be said to have a different texture; polished mahogany and birch, or polished lunel marble and Roman stone are obvious examples. But the subtlest effects latent in the textural qualities of materials are those obtained by contrast and counterpoint: by the alternation on the same surface of materials of different texture.

Our forefathers always had a keen sensibility for texture, and the pictures and notes which follow have been prepared to demonstrate their virtuosity in the use of this element of architecture. They also show, by comparison in the mind's eye, how far contemporary architecture, whether modern or "traditional," has still to go before it can claim the same range and variety.

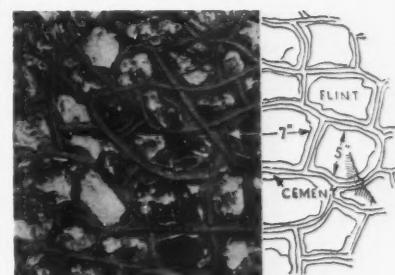
The scene is Lewes, the County town of East Sussex, and its immediate environs, and the photographs are given as examples of wall finishes in the local vernacular rather than as a general classification of textures. There are, of course, countless textures peculiar to other districts but the survey is limited to Lewes in order to emphasize the diversity of surfaces evolved within a quite small area.

## I Flint

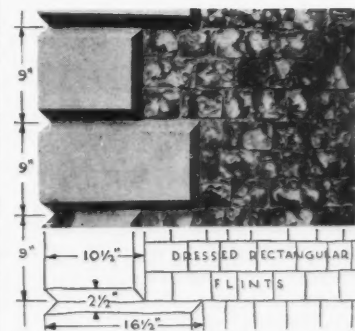
The most common form of flint wall is that in which flints are picked up at random and laid in local cement mortar. Flints of all shapes and sizes are used, but the larger stones are fairly evenly distributed throughout the mass and are, where possible, lapped in both directions. For this farm-house wall at Firle, large silver-grey and black flints are set in a broad expanse of cement, mixed with coarse sand and minute multi-coloured pebbles, which gives, in a close view, a secondary texture in a minor key.



In this type of wall the flints are roughly knapped to present a flat polygonal surface on elevation, the irregular portion being bedded in cement in the wall. They are fitted together, leaving comparatively thin joints. The cement of the joints is often raised to a half-round section, usually about  $\frac{1}{2}$  in. in diameter, superimposing on the essential flint character of the wall one of writhing and twisting cement lines.



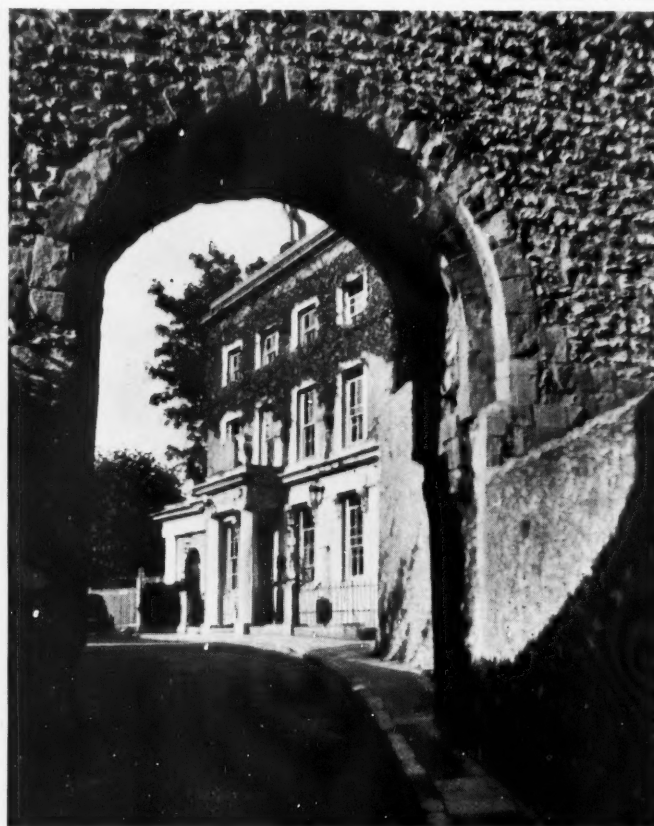
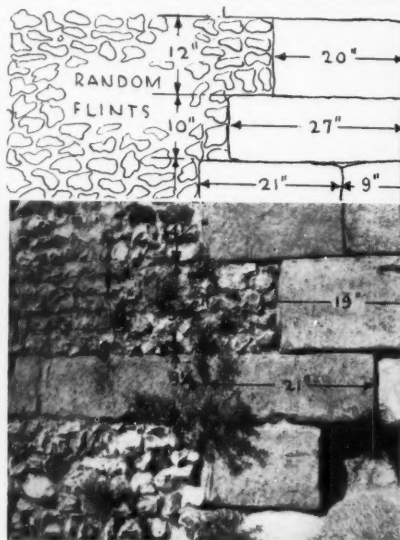
The exact opposite of the technique where the cement preponderates is the knapped and squared flint wall with hair-line joints. To obtain a true rectangle the flints are carefully cut, and this, with the suppression of the joints, makes a hard, sharp and sparkling texture. The walls of this house in High Street, Lewes, are of squared flints, and emphasis to their mosaic-like quality is given by the broad stone quoins. The enormous expenditure of labour required to chip so hard a material into true and even surfaces makes this a comparatively rare technique.



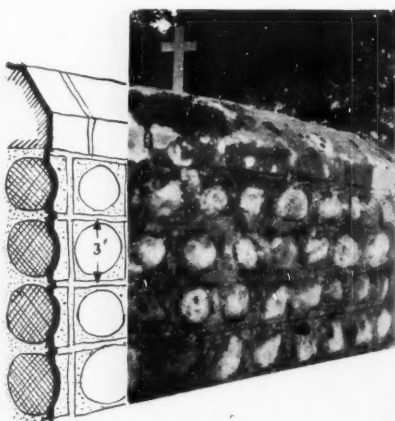


# I Flint

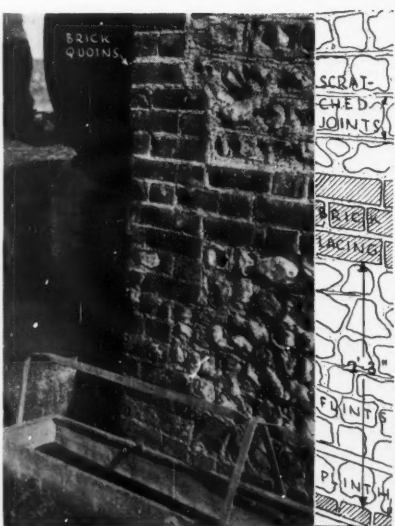
Flint walls do not offer a very great resistance to stress or strain, and in consequence large areas are invariably strengthened at their weakest points with dressed stone or brick. The famous early fourteenth century barbican or Keep of Lewes Castle is a good example of the flint wall with stone dressing. The rough flints with their deep shadows suggest the great thickness of the walls of the building whilst the smooth dressed stone arches, abutments, groins and machicolations define its structure and give the whole a sharp precision of outline.



There are many examples in and around Lewes of spherical flint walling. This type has carefully selected flints, of similar size and as round as possible, laid in cement, usually with four courses to a foot. The shape and not the silica composition of the flints give the wall its texture, as, being unbroken, they show only their grey outer skins. A wide range of texture is obtainable, depending on the depth to which they are set in the cement and the treatment of the joint. In these two walls, both at Glynde, they are set well in the wall and flushed up with cement so that they appear as spots in a general plain surface.



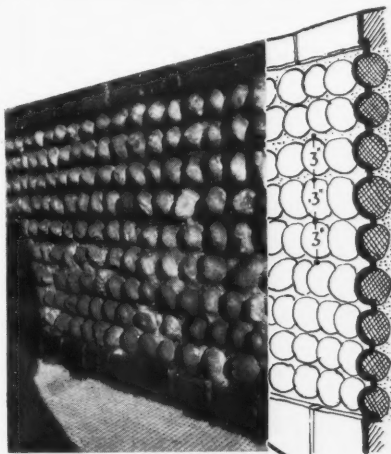
Flint's deficiency in transverse and longitudinal strength is often remedied by lacing courses of flat stone, brick, or tiles. This barn at Beddingham is of flint with brick quoins and lacing courses. The latter are only one course deep and occur in the gable so as to strengthen it against the outward thrust of the thatched roof. The more usual practice is to have three courses of brick spaced at 3 ft. to 7 ft. intervals, as in the smaller barn alongside, shown in the detail. Notice here how a rough attempt has been made to emphasize the coursing of the flints by scratching horizontal lines, coinciding with the brick courses, in the cement.



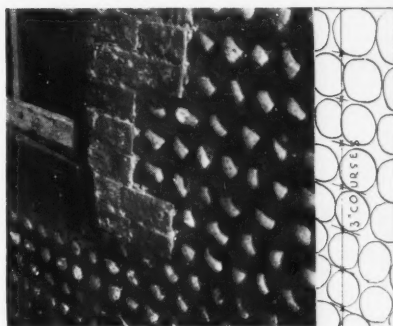


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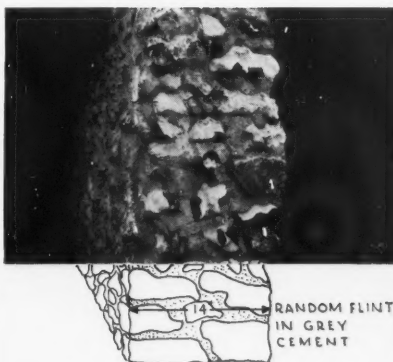
Another type of flint cobbles has the rounded flints half in and half out of the wall, so that the cement, being lost in the shadows of the hemispheres, no longer contributes to the texture. The walls of this cottage at Little Dene look rough at a distance, but near-to the smooth surface of the individual flints becomes the essential texture.



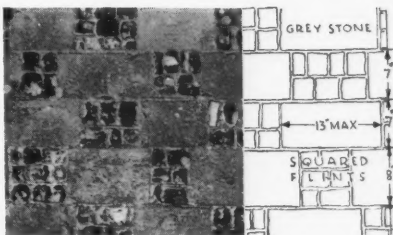
A window detail in round flints and brick. As in ordinary brickwork the quoins are first built up to act as profiles for the lines, and the infilling work is ranged between them. In this case the quoins run 13½ ins. and 9 ins., to avoid cutting, and the courses rise four to a foot.



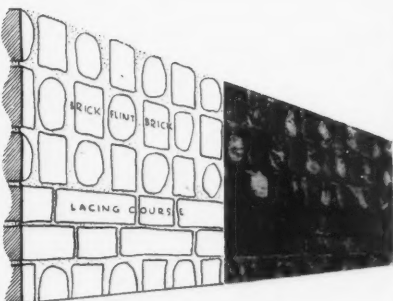
The two churches are Southease and Southover. Although each is of the same material and each is essentially ecclesiastical in character, they are of quite different and highly individualistic design. Southease has random flint walls with stone dressings. The detail shows a random flint wall, in this case to a garden, with its large external facing stones lapping over each other, and smaller stone hearting. The usual procedure is to build up the quoins, carefully bed the facing flints—selected for uniformity of size and shape—and then fill in the spaces with rough stones in cement.



Southover church has chequered stone and flint walls. The flints are carefully squared and bedded in fine cement to courses. It will be noticed that each group of flints is shorter in length than the stones either above or below it, thereby avoiding a duality of material and giving the flints the appearance of being set, jewel-like, in a broad expanse of stone.

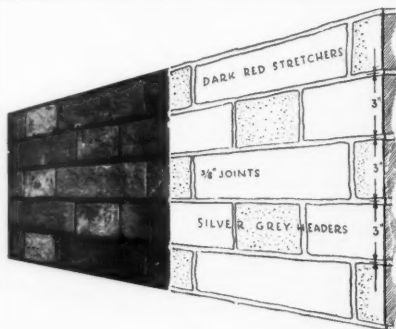


Flints are often combined with other materials, usually those found at hand, for garden and farm walls. This example has round flints alternating with header bricks, giving a chequered surface. The bricks are laid across the wall giving it a certain amount of lateral strength, and lacing courses are introduced for horizontal reinforcement.

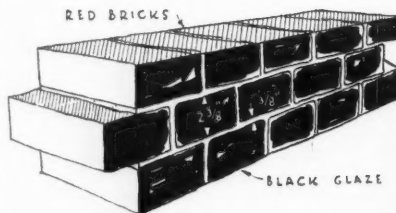


## 2 Brick

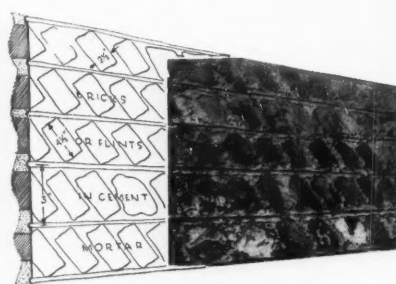
The most interesting local brick is a warm dark red variety with headers fired a silver grey colour. The contrast provided by the latter is usually emphasized by laying the bricks to Flemish bond. Further emphasis is often given to the pattern because the joints are subjugated to the wall surface by being dark and recessed. This chequered effect obtained with vitrified headers was an eighteenth century practice, and probably developed out of Tudor diapered brickwork.



Another local brick for which Lewes is notable (it is hardly found anywhere else) is made from a dark red sandy clay and has headers covered with black glaze. It is laid to header bond with thin joints, producing an all-over glazed surface which in sunlight gives changing intensities of black and white. This Georgian house near Lewes Castle is one of the best examples.

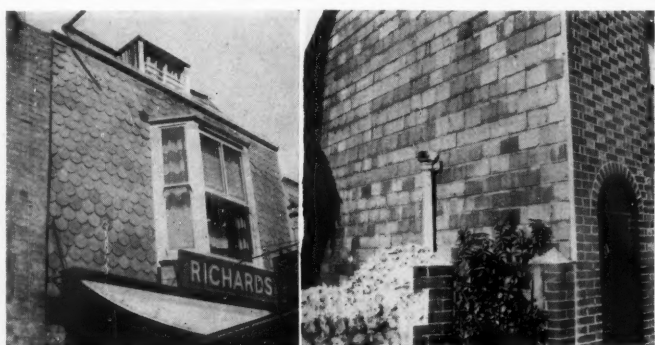
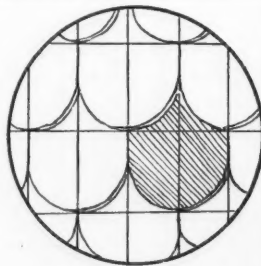


A most distinctive brick bond of the Lewes district is that used for 9 in. garden walls, and consists of header bricks laid diagonally. Large rectangles of cement occur between the corners of the bricks and the perpendicular, and bed joints are eliminated; although in place of these latter the courses are often emphasized by scraping horizontal lines on the cement surface.



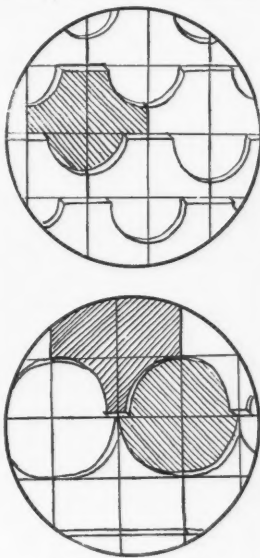
## 3 Slate Hanging

The nature of slate (or tile) hanging is that of a sheathing. It is most commonly used on upper floors only, providing a contrast of texture with the material of the wall below. As the slates or tiles overlap, their own texture is given by the thickness and the outline of their lower edges. Plain slates are shown used in an Edwardian villa in abrupt juxtaposition to a red-brick wall. Fish-scale slates are shown used in the upper part of a shop in the High Street and in a detail of their setting-out.



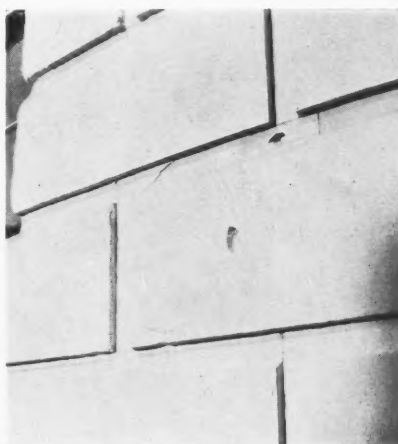
## 4 Tile Hanging

Tiles, having a thicker edge than slates, give a more broken surface. The tiles are slightly flatter than those used on roofs and are fixed with wood pins to oak laths. In exposed positions they are often bedded in lime or cement mortar, and are sometimes painted. Plain tile hanging is shown on an early Victorian farmhouse, which has a cream painted brick ground floor. The hipped gable is a characteristic Sussex form. Two types of decorative tile are shown, each with a detail of its setting-out. The tiles to the house in Church Row, upper example, have a quadrant knocked out of the two bottom corners which forms, when they are placed together, a series of semi-circles with their bases at the bottom, as distinct from the fish-scale type which is the other way up. In Anne of Cleves' House, lower example, a row of each type of tile is hung above each other forming complete circles. In both these examples bands of decorative tiles alternate with bands of plain ones thereby heightening the pattern.

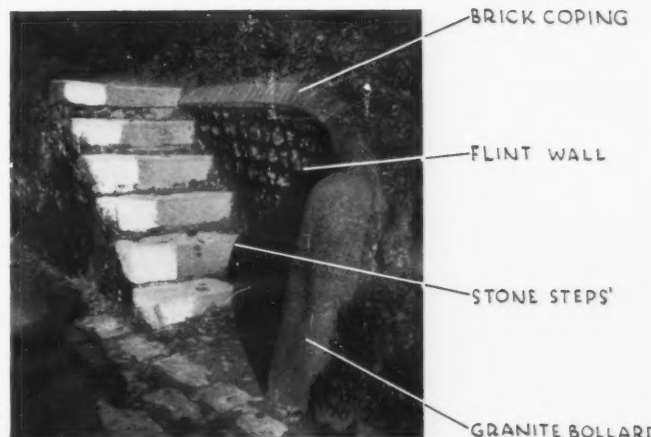


## 5 Stone

There are few stone buildings in the district owing to the preponderance of flint. The County Hall in Lewes High Street, however, was built (in 1812) of stone, probably because this material was looked upon as being more dignified than flint, the material of the local cottages. The walls, shown also in the detail, are built of carefully dressed blocks accurately bedded. It will be noticed that the joints, as in all good ashlar work, are so fine that they are almost lost in the shadows of the channelling.



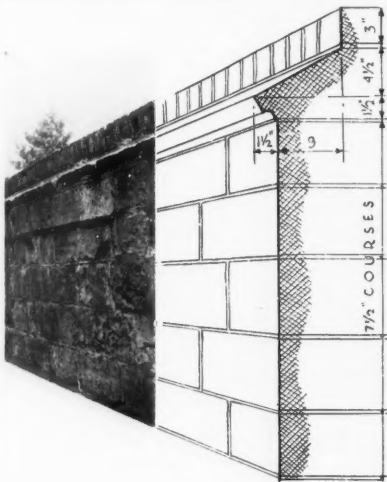
This flight of stone steps leads up from a steep hill on to a path which climbs the Downs. The retaining wall running straight out from the steps and then curving both vertically and horizontally to be stopped by the granite bollard, the neat brick coping, and the simple slabs of stone with their painted ends, all betray a spontaneity of conception which could only have taken place on the site. There is the maximum exploitation of texture—but one that arises from the judiciously chosen materials: a smooth dense material for protection, a rough hard material to thrust back the earth and a more even hard one to walk on.





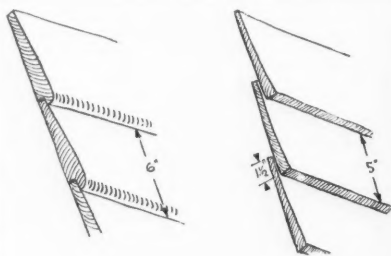
## 5 Stone

Another example of ashlar work is this house with bow-fronted windows in the High Street. Here the stone is rather soft and in consequence the texture is variegated by the different intensities to which it has weathered and stained. The detail shows cheaper coursed stone work, of the type known as "regular coursed rubble, straight cut face" in the garden wall to Anne of Cleves' House. The original stone coping has been replaced by a course of bricks on edge, which is rather out of scale with the rest of the wall and gives a very abrupt change of colour and texture.

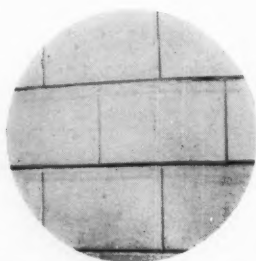
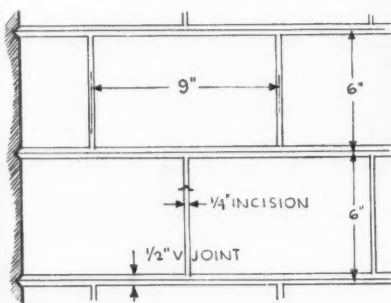


## 6 Wood

A favourite Sussex wall finish is weather boarding. The texture of this type of wall is dependent on the contour of the joint and the material applied for weatherproofing. The two most common types, which are shown in the diagrams, are the rough feather-edged board with square joint (usually creosoted) and the more expensive wrot board with rebated joints and painted finish. As with tile-hanging, it is most commonly found on the upper storeys of the building, which usually have a brick base.



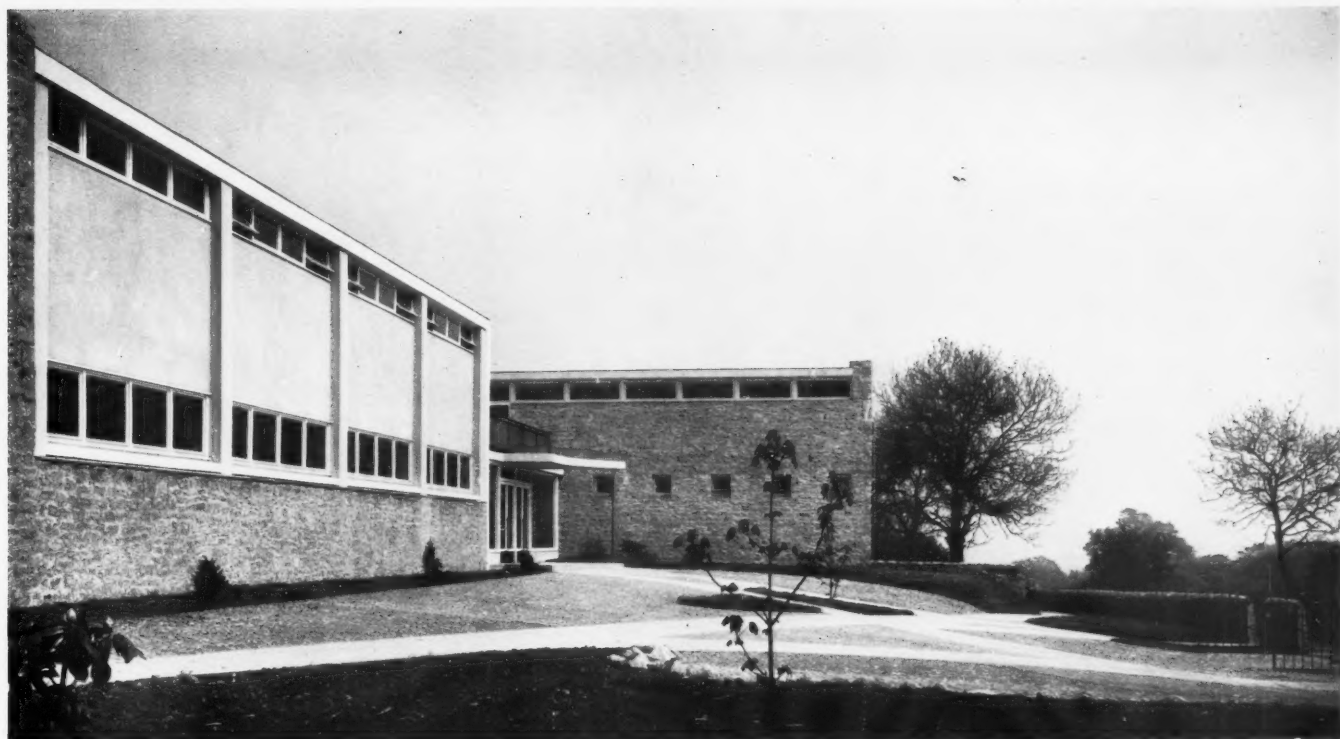
The concluding example is a rather more freakish one: the wall surface of an early nineteenth century house in Wellington Street, Lewes. The house is of framed timber construction with V-jointed boarding, and the latter has vertical grooves cut in to the surface of the boards, in imitation of stonework. It is hardly a realistic imitation, however, for whereas the practice at that time of lining up cement or plaster surfaces often made them slightly resemble stone, albeit a stone with a very peculiar texture, it is the nature of wood to shrink and swell which in this case gives the genuine horizontal joints a quite different intensity of line from the false vertical ones.



The close-up details and the photographs illustrating tile-hanging and timber are by the author. All the other photographs are by J. M. Richards with the exception of the two of Southease and Southover churches which are by Messrs. Reeves of Lewes.



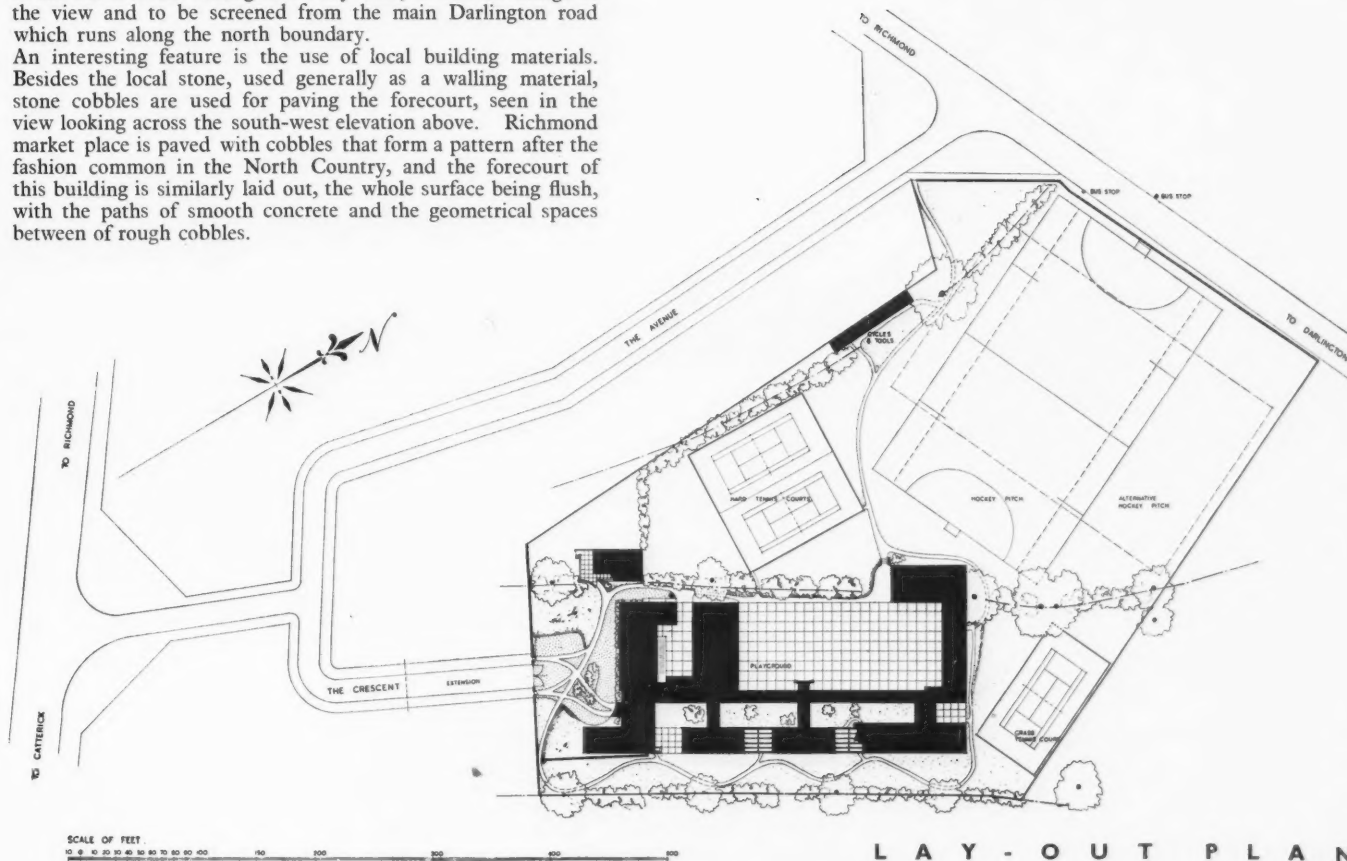
# SCHOOL AT RICHMOND, YORKSHIRE

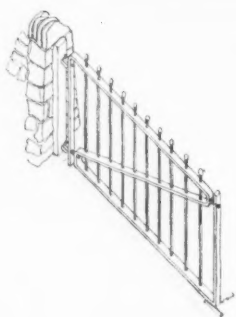
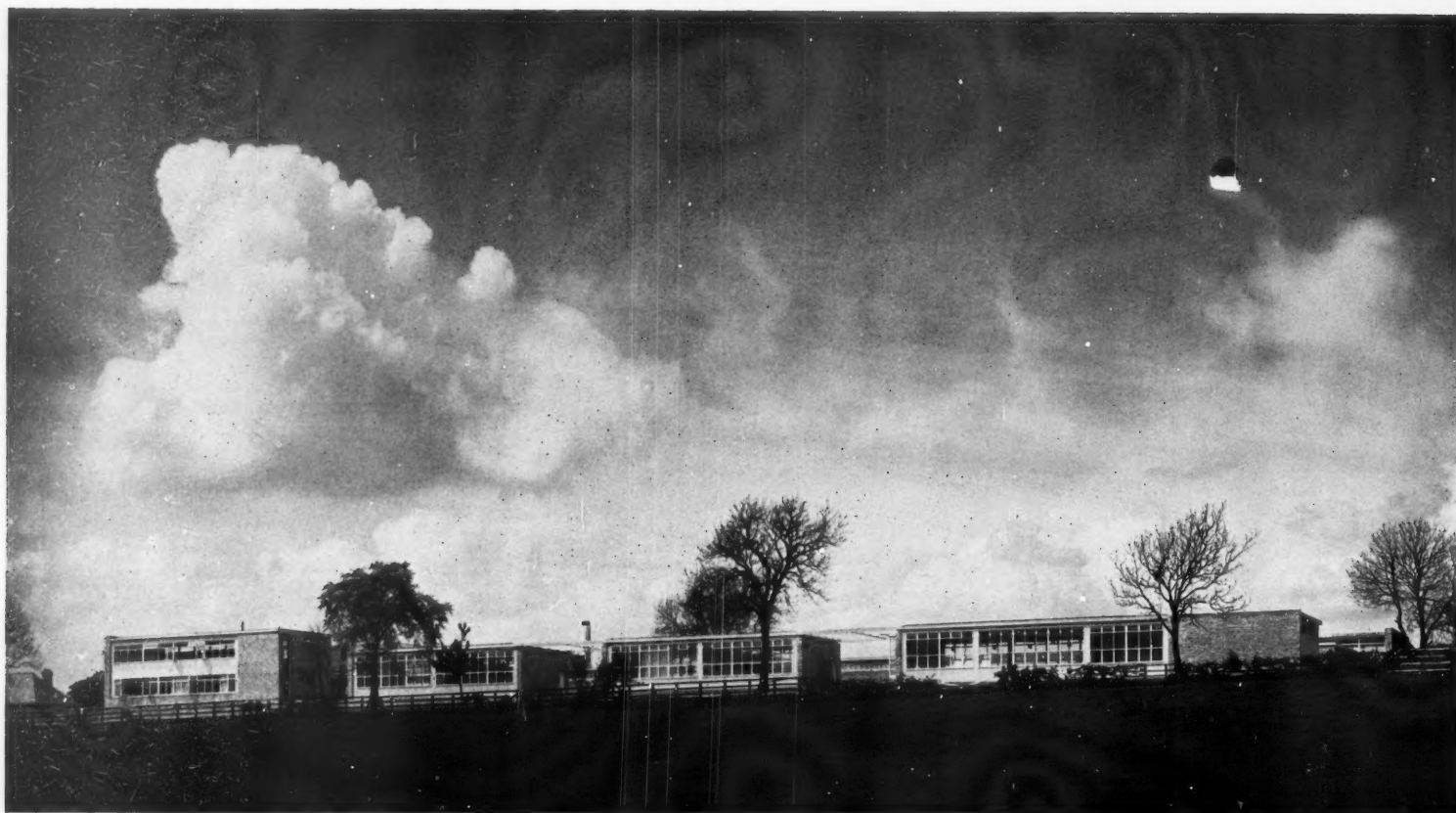


This is a girls' High School with accommodation for 160 pupils, and forms part of an ambitious building programme recently initiated by the North Riding Education Committee. The site is about half a mile from the centre of the town, on high ground commanding a view to the south-east of about 30 miles to the Cleveland Hills. The building is placed on the south-east part of the site to avoid cutting down any trees, to take advantage of the view and to be screened from the main Darlington road which runs along the north boundary.

An interesting feature is the use of local building materials. Besides the local stone, used generally as a walling material, stone cobbles are used for paving the forecourt, seen in the view looking across the south-west elevation above. Richmond market place is paved with cobbles that form a pattern after the fashion common in the North Country, and the forecourt of this building is similarly laid out, the whole surface being flush, with the paths of smooth concrete and the geometrical spaces between of rough cobbles.

**DENIS CLARKE HALL,  
ARCHITECT**

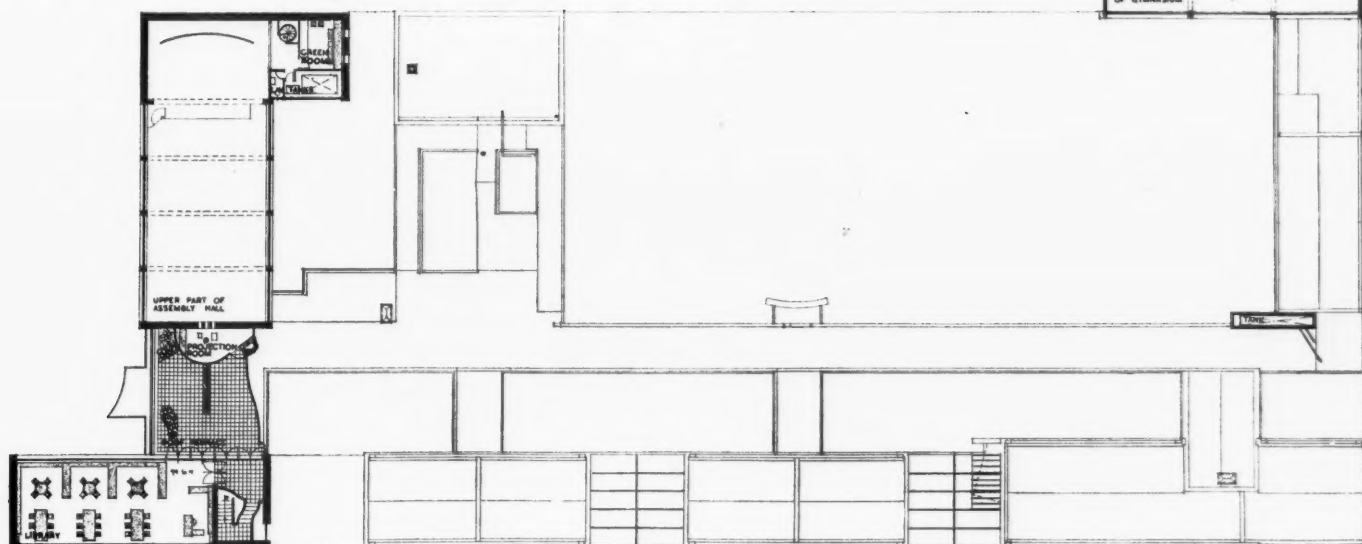
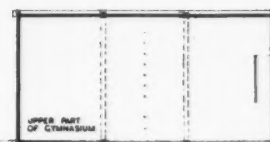




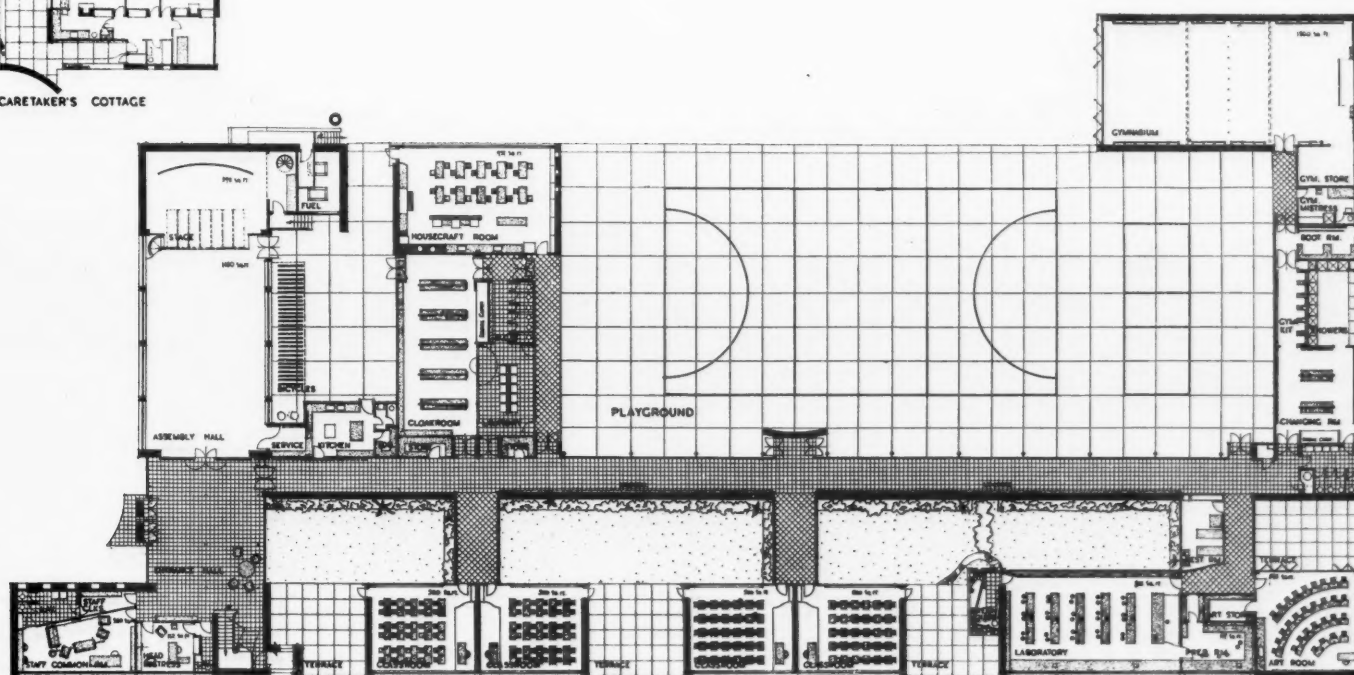
## The Exterior

An especially interesting feature of the building is the use of the local stone. It is used in a typically local way, in the form of solid rubble walls, for the portions of the building that did not demand openings larger than could be spanned by a stone lintol, the walls with larger openings being of concrete frame construction. Each pair of classrooms is a nearly isolated pavilion, of which two sides consist of large windows set in these concrete frames, as can be seen in the view from the south-east, top, the

direction in which all classrooms face. The two-storey block on the left contains the staff rooms and library. The south-west or entrance elevation, bottom, shows the solid stone wall forming the end of this block and the concrete framed construction of the assembly hall. The exterior concrete is painted in pale tones of grey, grey-pink and grey-blue, which give a neutral effect from a distance. Left, a sketch of the wrought-iron gate in the boundary wall.



### FIRST FLOOR PLAN



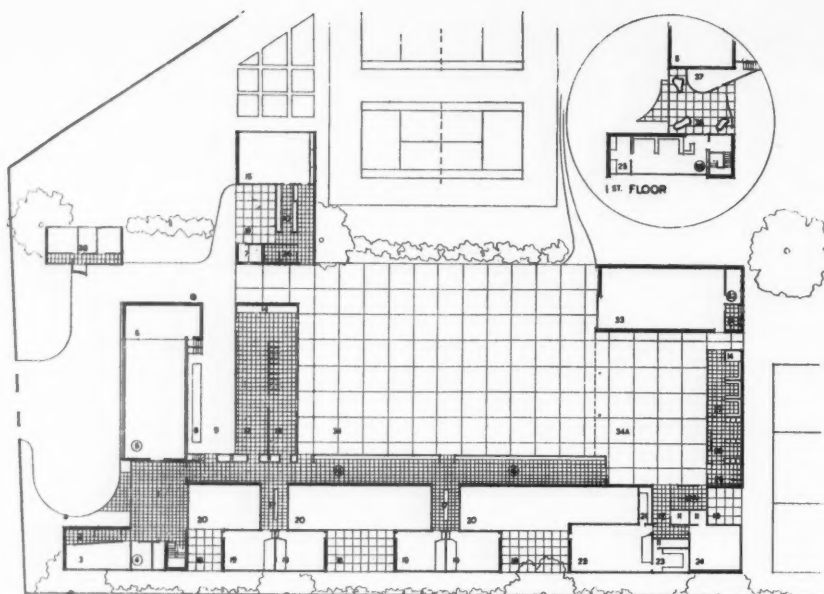
### GROUND FLOOR PLAN

SCALE OF FEET

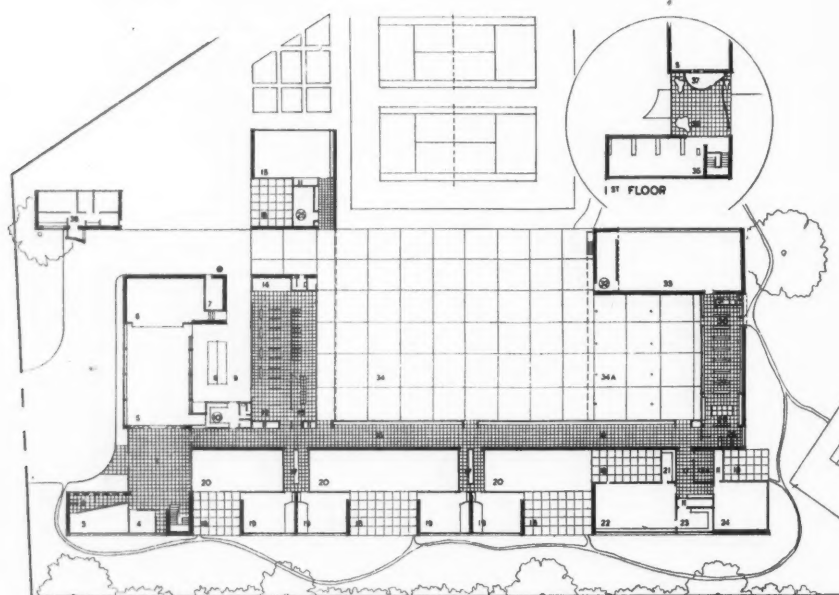
17



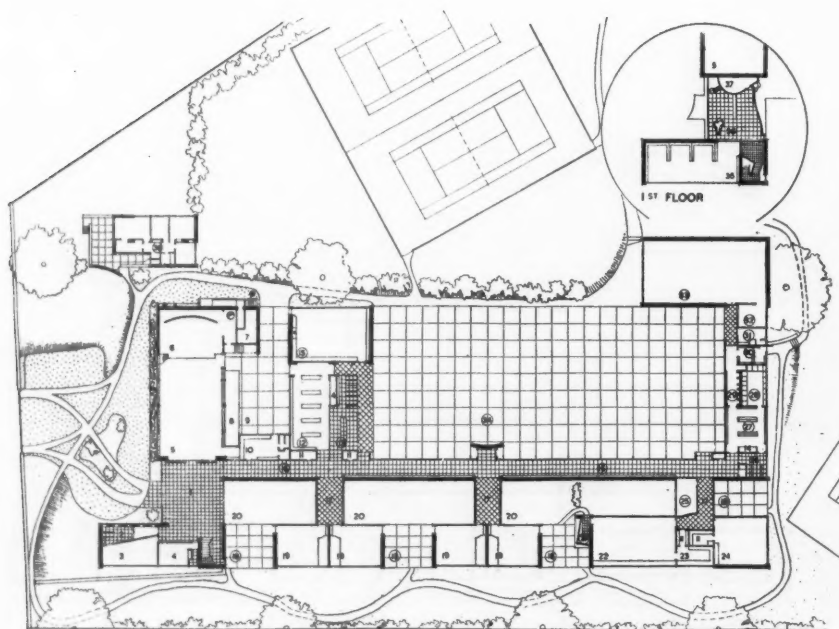
# A n a l y s i s



SKETCH PLAN



MODIFIED PLAN



FINAL PLAN

THE architect of the building was one of the winners of the "News Chronicle" schools competition, held in 1937, and the plan is largely based on the research he did at the time. The site was sufficient to allow free development of plan and to accommodate nearly all the requirements on one level. The two principal governing factors were the need for even light and ventilation throughout and the importance of complete acoustic isolation of all parts intended for mental work. These are achieved by isolating the classrooms in pairs as separate pavilions with open terraces between and connected with the central corridor of the building by short glazed corridors. This allowed them to be lighted from the whole of two opposite sides and to be isolated, by open space and by the stone wall of the central corridor itself, from the regions where noisier activities take place (see the diagram on the facing page). The terraces between the classrooms and the open courts behind are planned so that the whole of their area receives sunlight at some time of the year with the exception of only a few square yards of the southerly corner. The floor of every working room receives sunlight at some time of the year over practically the whole area, while the working level receives sunlight over the whole area. Divisions between classrooms are 9 in. brickwork to give sound insulation.

The planning of the classrooms on this principle also had the advantage of allowing the local stone to be simply and expressively used for wall construction. No concrete lintols are incorporated with the stone, which is used only for solid walls (as at the ends of the classrooms), the highly glazed walls (as at the sides of the classrooms) being built up within a concrete frame. A similar differentiation of structure is made throughout the building and contributes considerably to its aesthetic interest.

The main corridor off which the classroom corridors open is the spine of the whole building. It is sufficiently wide to carry the whole load of the circulation at peak periods and gives direct access to the playground at frequent intervals. It contains all the book lockers along its south-east wall, and also forms the spine for the main services and heating installation.

Although in its general principles the planning is the same as in the architect's competition scheme, it naturally had to be reconsidered to suit the particular requirements and the site. The final plan was arrived at after submission to the Education Committee in three stages. These are reproduced alongside, and the progressive criticisms made at the time and the points of difference between the three versions are summed up below. The numbers against each point refer to its position on the plan (see key at foot of page).

## SKETCH PLAN

Headmistress's room too small, 4; eating to be in assembly hall, 5; main corridors to serve changing rooms and laboratory, etc., 16; gymnasium storage insufficient, 32; library to be enlarged, 35; building too near south-east boundary.

## MODIFIED PLAN

Kitchen moved to serve assembly hall, 10; rest-room moved from first floor, 25; gymnasium store moved and enlarged, 32; building moved back from south-east boundary. Centre hedge omitted.

## FINAL PLAN

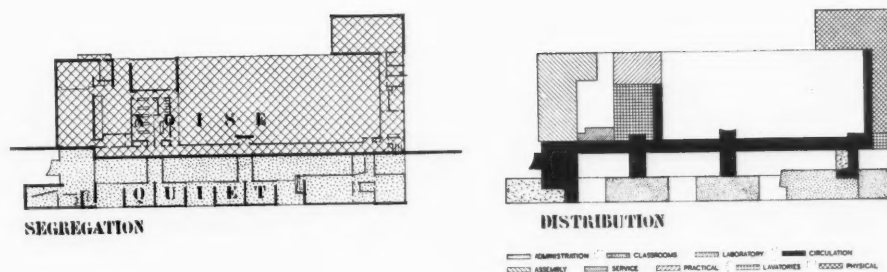
Main cloakroom and lavatory reduced in area, 12-13; housecraft room included in cloakroom block, 15; secondary cloakroom omitted, 12a; width of corridor reduced, 16; greenhouse moved, 21; gymnasium and changing rooms revised, 27-33; rest-room moved, 26; area of terraces and playground reduced, 18-34; covered playground omitted, 34a; caretaker's cottage enlarged to three beds, 38; centre hedge reintroduced. Details of site layout decided upon.

## KEY TO PLANS

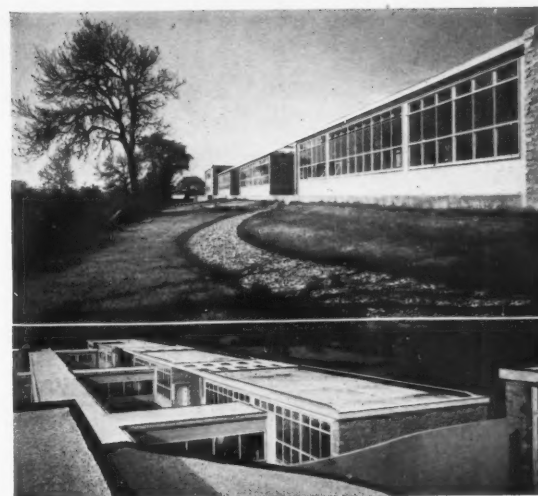
- |                        |                          |                          |
|------------------------|--------------------------|--------------------------|
| 1. Entrance hall.      | 14. Drying cupboard.     | 27. Changing room.       |
| 2. Staff cloaks.       | 15. Housecraft room.     | 28. Shower room.         |
| 3. Staff room.         | 16. Main corridor.       | 29. Kit lockers.         |
| 4. Headmistress.       | 17. Secondary corridors. | 30. Boot room.           |
| 5. Assembly hall.      | 18. Terraces.            | 31. Gym. mistress.       |
| 6. Stage.              | 19. Classrooms.          | 32. Gym. store.          |
| 7. Fuel store.         | 20. Internal courts.     | 33. Gymnasium.           |
| 8. Cycle rack.         | 21. Greenhouse.          | 34. Playground.          |
| 9. Yard.               | 22. Laboratory.          | 34a. Covered playground. |
| 10. Kitchen.           | 23. Prep. room.          | 35. Library.             |
| 11. Store cupboards.   | 24. Art room.            | 36. Roof terrace.        |
| 12. Cloakroom.         | 25. Rest room.           | 37. Projection room.     |
| 12a. Secondary cloaks. | 26. Secondary lavatory.  | 38. Caretaker's cottage. |
| 13. Lavatory.          |                          |                          |

S

# o f t h e P l a n



DIAGRAMMATIC PLANS SHOWING SEGREGATION OF QUIET AND NOISY AREAS AND GROUPING OF VARIOUS FUNCTIONS



A view looking along the south-east front of the building showing the classrooms grouped into pairs and separated by open terraces, and a view from the roof of the assembly hall block showing the central corridor and the short cross-corridors leading to the pairs of classrooms with more open courts between.



Caretaker's Cottage

The caretaker's cottage, a one-storey building, is situated near the western corner of the site, commanding the forecourt and main approaches. This is the south-east elevation, containing a covered entrance porch in the centre. The curved stone wall on the left screens a wide paved terrace in front of the living-room windows.





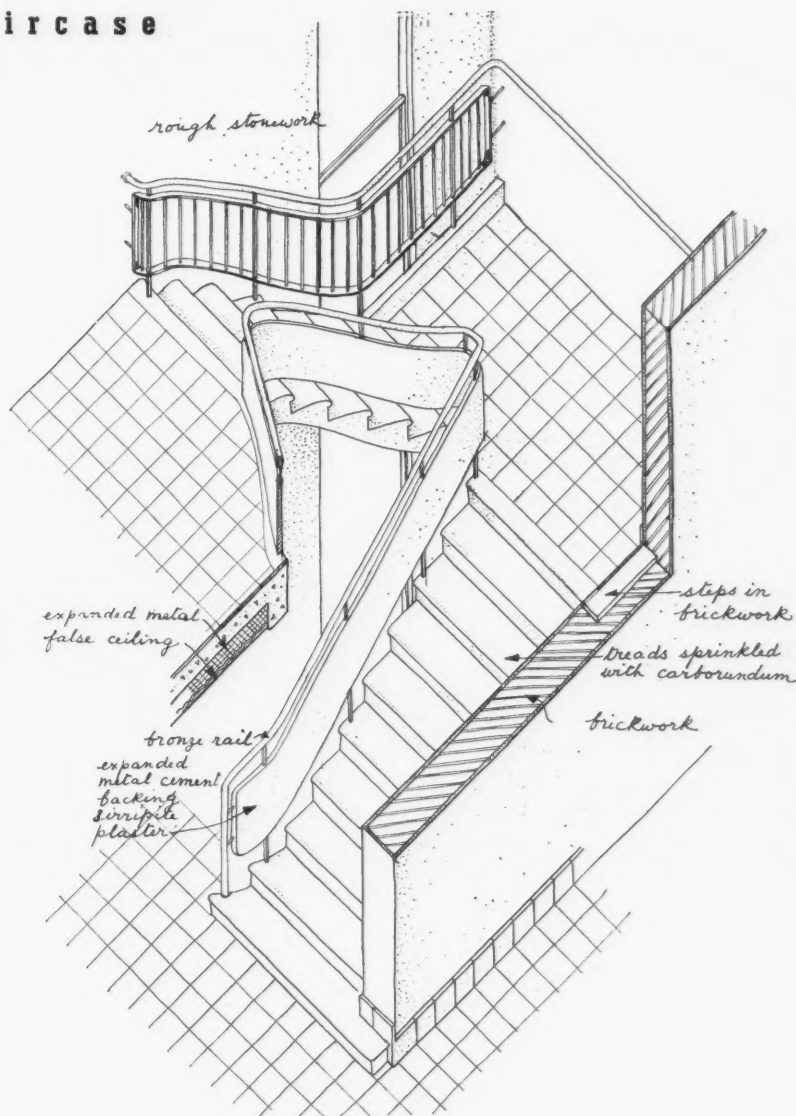
## Entrance Hall and Staircase

The main entrance is on the south-west side and forms in the elevation a glazed connecting link of lower height between the square stone mass of the two-storey administration block and the long stone and concrete side wall of the assembly hall (see the general view from this direction on page 16 and the drawing of this elevation at the top of page 17).

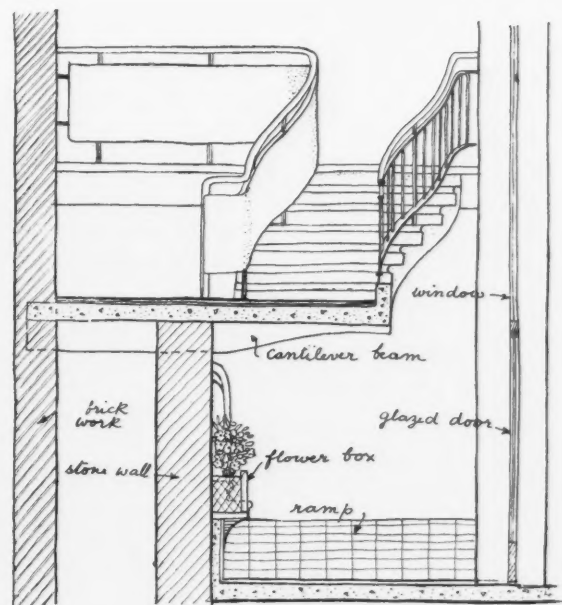
The doors themselves are protected by a concrete canopy, curved in plan and supported by a single steel column. The doors lead directly into the large entrance hall. The exterior detail (facing page, top) also shows the relationship in plan between the entrance and entrance hall and the main circulation of the building. Looking right across the entrance hall, through the large window at the back, the main corridor can be seen running away at right angles to the entrance elevation, with the cross corridors leading to the classrooms beyond the intervening open courts. This side of the main corridor is lit by small mullioned windows high up, as the wall forms the main acoustic barrier. The main glazing of the corridor is on the other side, facing the playground. The cross corridors are fully glazed. Above the entrance canopy can be seen the curved wall of the assembly hall projection room.

The view of the entrance hall itself (facing page, bottom) looks outwards through the entrance doors, and shows the flank of the administration block. The forceful use of materials with emphasis on the different types of structure, from which the building largely gets its character, is well illustrated in this view, in the way the stone wall of the administration block runs into the entrance hall with the frame of the glazed wall butting up against it. The entrance hall is paved with square blue cement tiles and the steel column is painted dark red. The wall between the entrance hall and the assembly hall is made to slide away so that the former can serve as an extension of the latter when extra seating accommodation is required.

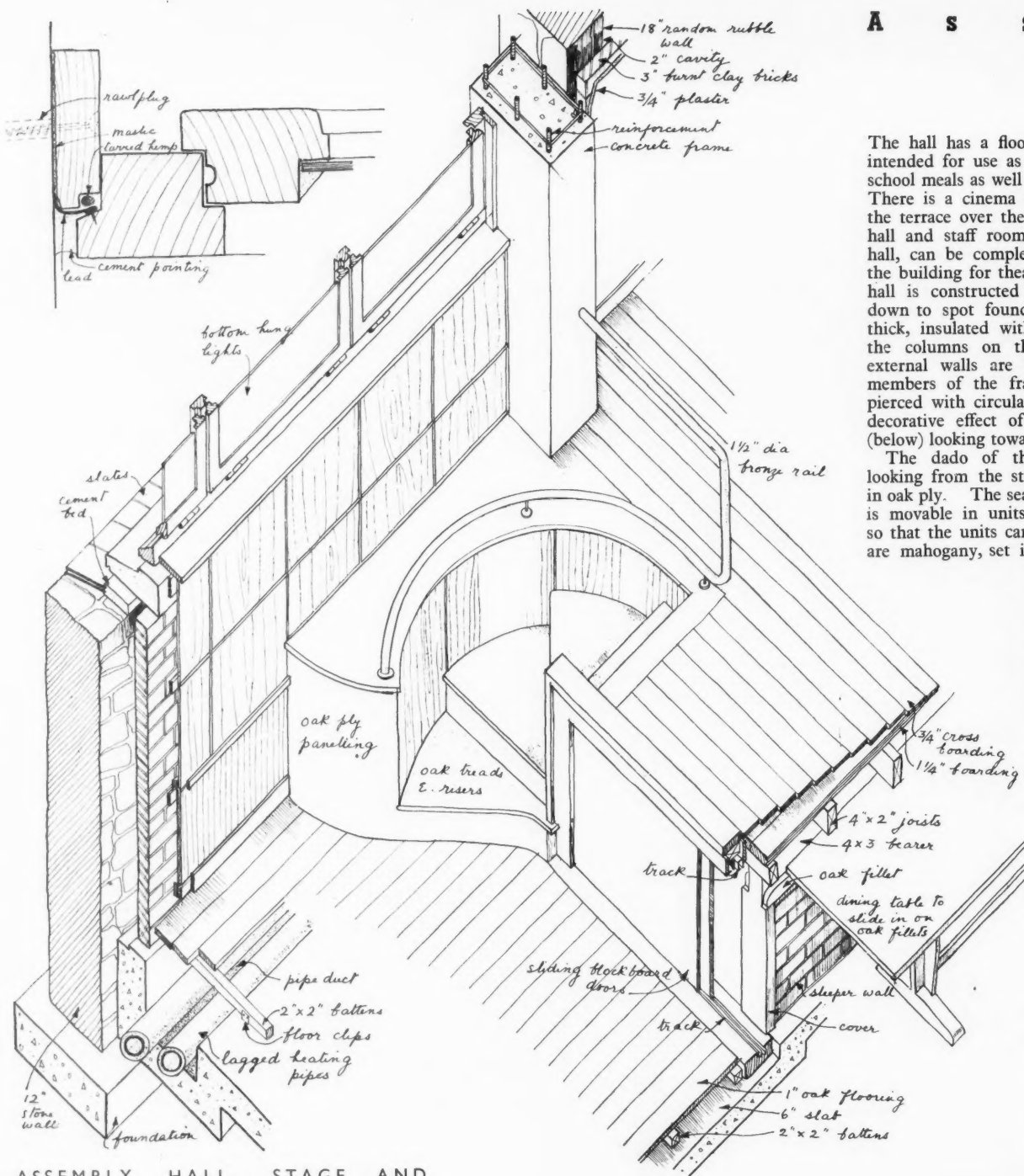
At the corner of the entrance hall is the main staircase (below) leading up to the library and to a roof terrace. It is also approached up a short ramp from the first of the terraces that separate the pairs of classrooms. The back wall of the staircase well is of the same rubble stonework as the outside. The internal wall, which actually carries the stairs, is of 13½ in. brickwork plastered, and a solid plaster panel is suspended in the bronze frame of the handrail. An all-bronze handrail lets the light through to the half-landing from the terrace window. The cantilever construction of the stairs and their interesting shape on plan can be seen in the axonometric diagram and section on this page.



CONSTRUCTION AND FINISHES OF MAIN STAIRCASE



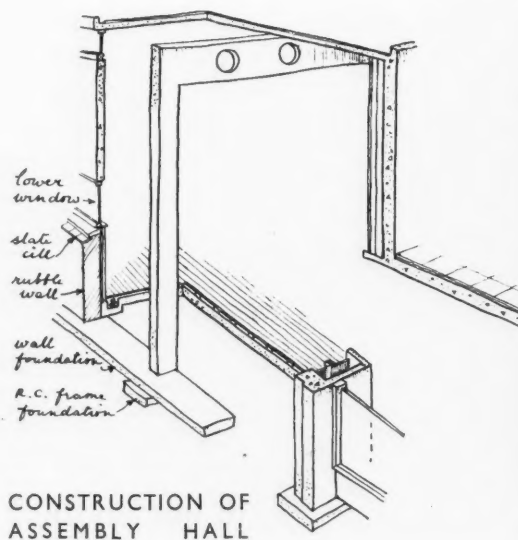
SECTION THROUGH STAIRCASE LANDING



ASSEMBLY HALL, STAGE AND STEPS, ALSO SHOWING TYPICAL WALL AND WINDOW CONSTRUCTION

The hall has a floor area of 1,800 sq. ft. and is intended for use as a theatre and cinema and for school meals as well as for general school purposes. There is a cinema projection room reached from the terrace over the entrance hall. The assembly hall and staff rooms, together with the entrance hall, can be completely isolated from the rest of the building for theatrical performances, etc. The hall is constructed on a concrete frame carried down to spot foundations. Concrete walls 4 ins. thick, insulated with 1 in. of cork, span between the columns on the side walls; elsewhere the external walls are rubble stonework. The roof members of the frame (see diagram below) are pierced with circular holes to lighten them. The decorative effect of these is shown in the view (below) looking towards the stage.

The dado of the hall, shown in the view looking from the stage (facing page), is panelled in oak ply. The seating, designed by the architect, is movable in units of six. The seats hinge up so that the units can be stacked. Seats and backs are mahogany, set in an oak frame. The ceiling and back wall up to the door head are painted gorse yellow, the columns and beams are pale grey blue with soffits and holes brick red, and the side panels between the windows are pale pink.

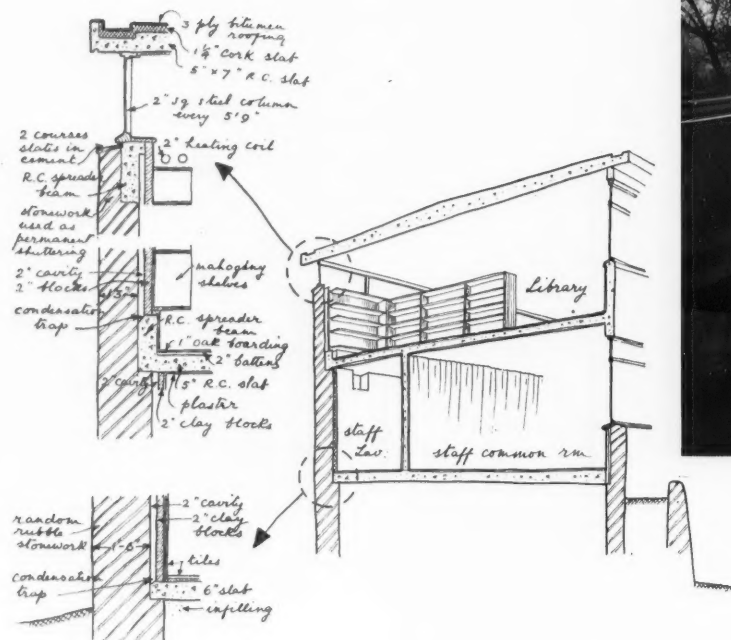


b l y H a l l





## Library



STRUCTURAL DETAILS  
OF ADMINISTRATION BLOCK



This is the only room on an upper level, and has continuous windows looking south-east. The furniture is in mahogany and birch. The diagram on the left shows the construction of the library and administration wing, and also typical floor, roof and wall construction. The random rubble stone external walls vary in thickness from 15 ins. to 24 ins. throughout the building, and have a 2 in. to 3 in. burnt clay block wall on the inside with a 2 in. cavity between to ensure absolute dryness and to give a smooth face for plaster. Internal partitions are of the same blocks. Stone walls are carried down to the ground, and where roofs and floors rest on them spreader beams are employed to distribute the load. Roof and floor slabs 4 ins. or less in thickness are solid reinforced concrete. Those of greater thickness are hollow tile.

## Classrooms

The classrooms, like all the other working rooms, have venetian blinds which are very successful in screening direct sunlight and producing an even intensity of light over the whole room, at the same time maintaining plenty of ventilation. The patch of sunlight on one desk in the adjoining photograph comes from a window of which the blinds were not drawn and demonstrates by contrast the evenness of the light elsewhere.

The standard classroom furniture, seen in detail on the extreme right, was designed by the architect. Both desks and chairs can be stacked by nesting, by the method patented by Alvar Aalto from whom special permission was obtained. The furniture is in mahogany and beech. The same photograph shows the other standard classroom fittings: teacher's desk, blackboard with floodlighting, clerestory windows over the door and venetian blinds over the other windows, shown drawn in the photograph. Each room has a different colour scheme, but all the schemes are based on a limited range of colours used in varying proportions.

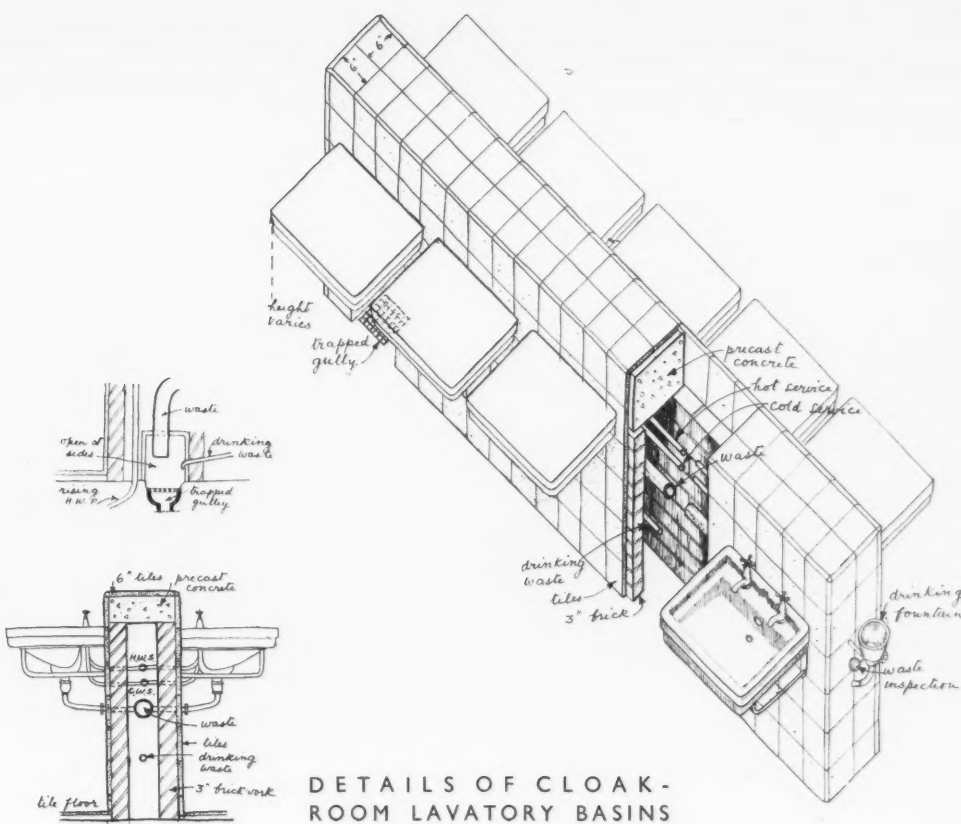


# C l o a k r o o m s

The cloakrooms are grouped at right angles to the main corridor, forming an angle enclosing the playground. They can be reached directly from the playground from a covered way which runs along their outside wall. The view on the next page, looking across the playground, is taken from this covered way. The cloakroom group consists of a large cloakroom, a lavatory and w.c.'s.

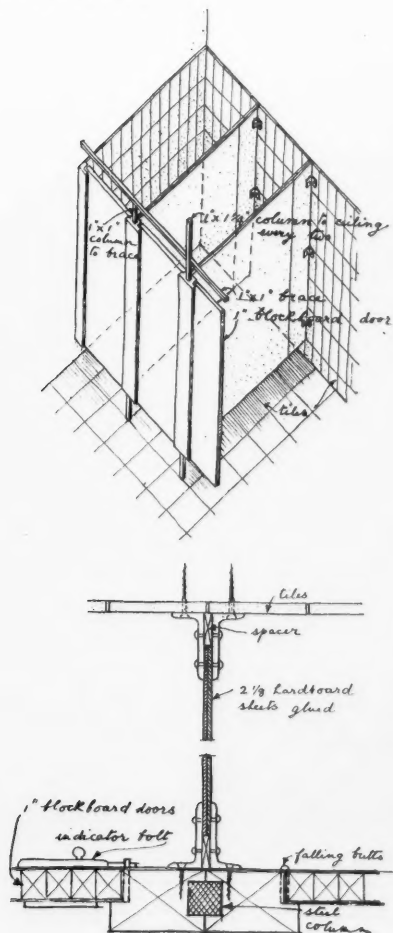
The lavatory, shown below, is separated from the playground by a partition wall consisting of concrete vertical members and panels of ribbed glass. The basins are arranged in two rows either side of a low tiled wall, leaving free floor space all round. This is a hollow brick wall with a precast concrete lintol and serves as a duct in which run all the service pipes to the basins and to a drinking fountain at the end. The diagrams on the right give details of this battery of basins and its service arrangements. Notice in the photograph how the height of the basin from the floor varies to suit children of different ages.

The diagrams below show the standard w.c. partitions used throughout the building. Square steel columns, every alternate one of which is carried up to the ceiling, are embedded in wood frames and support hardboard partitions.



DETAILS OF CLOAK-  
ROOM LAVATORY BASINS

DETAILS OF  
STANDARD W. C.  
PARTITIONS





Top, looking across the playground towards the gymnasium and changing rooms. The main corridor and one of its entrance vestibules is on the right. The gymnasium, like the assembly hall, is of concrete frame construction, with spot foundations. The side wall is stone and the end wall over the doors is reinforced concrete painted deep brick-red. Bottom, the interior of the gymnasium looking outwards.

## Playground and Gymnasium



In these monthly articles the subjects discussed are primarily aesthetic ones. They are written on the assumption that efficient planning, sound structure and general honesty are now firmly established as the things which must come first, instead of being subordinated to stylistic pedantry, so that architectural criticism can now turn its attention to the *appearance* of buildings, on which rests the quality of architecture as art and on which the Man in the Street is compelled to judge it.

## CRITICISM By James MacQuedy

ONE of the things that give one faith in the future of modern architecture in this country is that it retains its flexibility. It has never lost the ability to learn the lessons taught by its own mistakes. An example of this is the way it has now recognized that the doctrinaire fondness for reinforced concrete which was typical of its early days led to many errors of judgment in the use of this material for surfacing—as distinct from structural—purposes, especially in town buildings.

It is probable that there is a future for plain or painted concrete surfaces when we know more about the behaviour of the material—even in the town where there is, after all, the precedent of Regency stucco, though it should be remembered that we live in an age of such financial instability that the architect has no right to rely on the constant repainting with expensive oil paint that stucco demands. But whatever their future there can be no denying the many failures of concrete surfaces in towns during the last few years. All of us who look at modern architecture know dozens of buildings that were conceived in an admirable modern spirit, are praiseworthy in many other respects and when new exhibited all the sparkle and elegance that modern architects have taken as their aim; but which after only a few months of wear in the smoky urban atmosphere were streaked with grime, stained and cracked; in short, wore an air so depressing—even squalid—that their critics had every justification for saying that if this was modern architecture it did not even pass the elementary test of being rational.

But we must give the modern architects credit for being among the first to admit these mistakes. It is, however, over-simplifying the question to say that they were guilty, in an excess of enthusiasm for novelty or in slavish pursuit of fashion, of using a material that was intrinsically unsuitable for its purpose. The trouble also was that they trusted too willingly to a material that was still in an experimental stage. We still do not know enough about the surface behaviour of concrete in all its forms and under all conditions,\* and it is possible that in due course science will provide architects with the complete answer to these difficulties. It is also possible, looking still further into the future, that the blessings of electricity may eventually so purify the atmosphere of our towns as to remove these difficulties altogether; but our northern climate will always remain, and however clean the air I, personally, cannot envisage plain concrete ever presenting a satisfactory surface without the sparkle of sunshine to give it life. In a climate that is damp and grey during three parts of the year we need either a material like brick and stone that

mellows sympathetically, or else the synthetic brightness of stucco sleekly finished and constantly repainted. Along with the latter I would not rule out exposed concrete in small areas, provided the obligation to paint it constantly is recognized and provided it is protected against surface water by some equivalent of the copings and cornices of classical design.

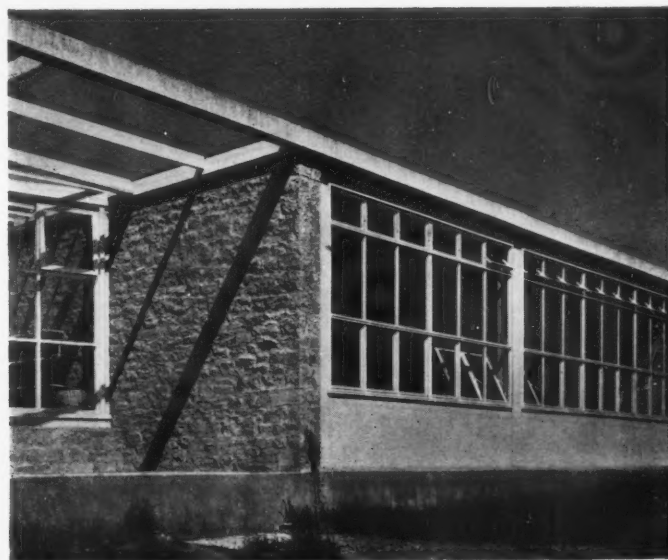
How are modern architects following up their discovery of the limitations of concrete as a surfacing material? The answer, I think, can be divided into two parts. First, it is obvious that as modern architects become more sure of themselves they are able to take within their embrace traditional as well as exclusively modern ways of doing things. It is only a matter of time for modern architecture to outgrow its first phase of being only interested in the so-called modern materials, which meant deriving aesthetic stimulus from exploring the potentialities of new techniques. Modern architecture being not a style to be adopted wholesale but a way of approaching design which may or may not result in the invention of style characteristics, any technique and any material is available for use provided it is used with integrity. In the past—and to a

less extent today—the modern architect has felt that many traditional methods were barred to him because they were too much involved with the wrong associations. They had been kidnapped, one might say, by the academies as food for their dilettante activities. The variegated pattern of brickwork was only part and parcel of the pictorial charm that had become a substitute for the essential qualities of architecture. The modern architect had first to exhibit architecture brought back to its essentials; having done that he can use its legitimate elements for their own sake.

First of all, then, he finds himself able to return to traditional materials—brick, stone, timber and the rest. He says that there are many materials in exist-

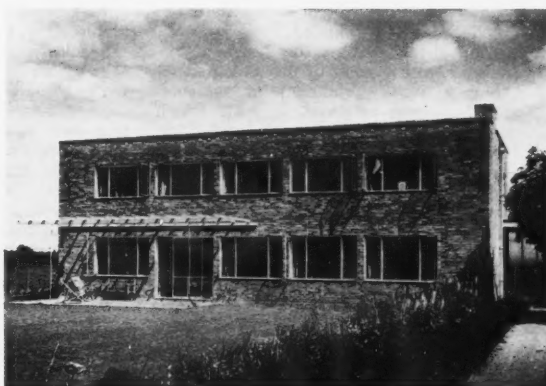
ence, and in their variety much of the richness of architecture lies.\* His ambition to exploit them is a clear advance on his previous contentment with the amorphous geometry of concrete. But secondly he says that the use of concrete for surfacing was only incidental to the use of concrete structurally. He does not want the disadvantages of the former to deprive him of the opportunities offered by the latter, which is indeed one of the things from which his new aesthetic—with its brand-new spatial vision and its characteristics of lightness and poise—is derived. So his second answer is to look for some sheathing or panel infilling

\* This richness is illustrated in the article on Wall Textures on pages 9-14 of this issue, and on page 36 is a small instance of how contemporary architects should not use traditional materials.



This school building at Richmond, Yorkshire, by Denis Clarke Hall, exemplifies both an interesting use of local materials in modern architecture and a characteristic modern emphasis of their structural nature: stone is used only where no large openings are required; elsewhere a concrete framed wall takes its character from the void rather than from the solid.

Modern buildings incorporating new materials with traditional ones to enable the latter to perform new tasks: concrete lintols making wide-span windows possible in a brick wall (house at Eton by F. R. S. Yorke); and steel columns allowing corner windows in brick construction (house at Welwyn by Eugene Kaufmann).



In contrast to the above: materials segregated according to their structural character instead of combined. A brick wall for small pierced openings; a timber one for large framed openings (house near Oxford by Samuel and Harding). It is not suggested that this method is superior to that of combining materials, but it produces an expressive character typical of the modern idiom.



\* Despite the industrious research conducted at the Building Research Station under Dr. Stradling.



1



2

## Unit Planning in Primitive Architecture

[Continued from page 27]  
that will conform to a reinforced concrete structural system and present a suitable surface to the elements.

Under this heading he has experimented with several impervious materials, such as ceramic tiles, glass panels and the like, and more are being developed. He uses them frankly as sheathing and produces the motif of a criss-cross pattern of joints, that is so familiar now but at first seemed so strange in contrast to the traditional patterns of bonding. He is not so lucky as his Italian or German brethren who have a natural material like travertine readily available. Tiles are ideal in towns but are expensive. The building industry can no doubt be relied on to produce cheaper alternatives in time.

Such synthetic materials, used thus in conjunction with modern structural systems, do enable the modern architect to go on developing his style along the lines his aesthetic vision has already taken him, exploiting the lightness and poise of a framed structure rooted at only a few points to the ground, whose character is echoed in the all-over pattern of the sheathing material stretched across the framework like a skin. But when he turns to the traditional—or what we may call the natural materials, in opposition to the synthetic—wood alone of them lends itself to the same structural handling, the same reduction if need be to framed or pre-fabricated sections. A timber-framed house is in this sense both modern and traditional, and it is not an accident that a fashion for timber houses among modern architects immediately succeeded the fashion for all-concrete houses. But the real test comes when he uses traditional material

like brick and stone, which have a structural character of solidity and massiveness quite opposite to the frame construction on which so much of the modern idiom is founded.

This brings us to the heart of the subject, to the point of discussing something of more permanent interest than the slowness or rapidity with which architects who have restricted their vision for tactical or disciplinary reasons are rediscovering the elements of their own craft; namely, how an architect designing in the modern spirit uses the traditional building



*Local materials used in a traditional way that also conforms with the characteristic modern principle of letting each material speak for its own kind of structure: the solid stone base and boarded upper storey of a house in Massachusetts by Gropius and Breuer. They are happily combined with a cantilevered concrete stair.*

crafts in a way typical of himself and different from the way of his academic predecessors. The answer is that modern architecture, like Gothic architecture, is based on the exploitation of structural principles and the extraction of aesthetic character from them. Being of scientific mind and having few preconceived notions the modern architect does not hesitate to combine in one building as many different materials as seem appropriate. But he makes the appropriate use of each contribute to the structural expression of the whole; indeed he makes a change of material point a change in the character of structure.

This typical modern play with the properties inherent in a variety of materials can best be illustrated by an example, and none could be better than the new school at Richmond in Yorkshire designed by Denis Clarke Hall.\* Here the architect for excellent reasons—notably its availability near the site, but also probably not excluding those reasons implied at the beginning of this article—has used the local stone. But he has not used it indiscriminately as a general walling material, obtaining the large window openings that modern school planning demands by the introduction of steel or concrete lintols. Instead he has accepted the essential solidity of the stone wall and has used the stone only where the plan demanded solidity and the modelling of the building demanded mass. For the walls containing openings larger than a single stone could easily span he has devised a concrete frame based on the large window unit and deriving its character from its very openness—the reverse procedure from piercing a solid wall and

then laboriously bridging the gap. The result is a striking alternation of solid and framed walls whose frank contrast of structural character gives its whole style to the building.

It is only a logical application, of course, of the familiar architectural idea of contriving character out of the expression of structure, but I feel that it is the most promising line for the modern architect to pursue now that he can take an interest once more in the traditional materials. Like all good architecture it invests materials with more than their inherent character. The stonework acquires a new massiveness by its use where its massiveness is absolute; the glazed framework more elegance where it is a frame in function as well as construction. The alternative method: the clever amalgamation of old and new materials—as with the concrete lintol incorporated in the brick wall—is entirely legitimate regarded as an application of science to modern building technique, but the segregation of material according to structural character\* in the way described above is also a contribution to clarity and articulation of the kind that modern architecture has an especial duty to contribute to the contemporary scene. For the contemporary problem is not merely the utilization of science. As much as anything else it is to rearticulate into a clearly visible structure the chaos that the multitudinous benefits of science have themselves created.

Reverting to the matter of surface finishes and looking again at the

\* A traditional instance of the same thing can be seen in tile-hung or weather-boarded houses, with their contrast between the upper storeys and the solid brick lower storeys. See the illustrations on page 14 of this issue.

\* Illustrated on pages 15-26 of this issue.



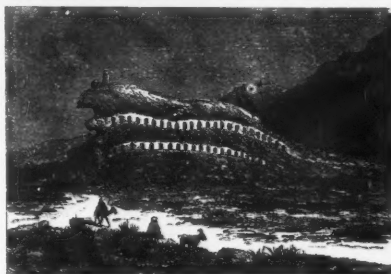


3

A small white mosque, visible in 3, is the focal point of the village, which is planned in large squares, steep, narrow streets running between up to the mosque. On the edge of the village are bigger cells used as granaries. The buildings seem to be a development of the Troglodyte caves, which are half-dug, half-built underground, or in a steep face of the hills, like sand-martins' nests. The same long vaulted shape is used and there are often cells built on the top of those dug in the cliff.

JOAN RAYNER

1, the approach to the village of Metameur. 2 and 3, the main square of the village showing the characteristic oven-like dwelling units built row on top of row. See also the frontispiece to this issue. The engravings on the right, from a page of travel sketches by P. Chevarrier, published in the *Illustrated London News* for March 3rd, 1883, show the similarly planned square or "bordj" of Haouia, still further south in the Ourghemma, and typical Troglodyte rock-dwellings in the same neighbourhood.



## B O O K S

### The Contribution of the Thirties

THE NEW ARCHITECTURE. By Alfred Roth. Zürich: Girsberger. 28 Swiss Francs.

FOR ten years, architecture has been steadily building itself up while the world in general and the arts in particular have been either knocking each other down or just falling to pieces. To those who believe that the times get the architecture they deserve (or, if you prefer the jargon, that architecture is a function of the changing social pattern), this looks rather like an anomaly, and it is not improved by remembering that most of the century's architectural fireworks went off during a period of all too apparent social tranquillity. No one, not even a cabinet minister, could possibly maintain that these have been ten years of good solid all-round development. Yet in the middle of this waste land, a whole new garden has taken root and flowered as never before.

The anomaly disappears, however, if you consider building activity as a whole—plainly, the times get the *buildings* they deserve, if not the architecture. The everyday brick-and-mortar muckheap is an entirely adequate expression of our seedy social pattern, just as the preceding universal slummary was. But where, in that case, does architecture come in? And how to explain this flowering of a new expressive order in the absence of a new order to express? Only, I think, by looking at the architects themselves.

Architects have been properly proud for several centuries that their muse is Mistress of the Arts. And as the Fine Arts themselves have been the property of the upper crust for nearly as long,

architects have acquired a cachet which is not perhaps, entirely of their own seeking. This high-brow stigma has never been more apparent than now, when the "contemporary" music is played in an empty Queens Hall, and the everyday music is old-fashioned stuff which comes out of a hole in a heavily capitalized box. Every artist is in the same position. Hence the evident frustration of even the best modern musicians, painters, and poets who (often in spite of themselves) confine their work to the connoisseur's concert hall, gallery, and slim volume. The nature of an architect's work, however, makes his position somewhat different. He need not *necessarily* be a parasite (especially in a world of his own making); and as far as "the new" architect is concerned, there is a literally concrete reason for revolution. His work is, then, the aesthetic expression—the only wholly valid one—of an aspiration, and it is none the less real for that. This is a severe limitation, for it means that it can only be appreciated and practised by those who believe in this aspiration, and it is only a minority, even of the highbrows, who do. So the New Architecture must admit to being caviar to the general.

This phenomenon, a separate highbrow aesthetic, has not always existed—it has existed only since art began to be pursued for art's sake, as an end in itself (the Renaissance). And while the vernacular still persisted as well, until the beginning of the last century, everyone was satisfied. But the old vernacular depended on the expressive handling of old materials, and when the materials and methods changed abruptly, it unfortunately did not change too—it just stopped. From this time on, popular art tried to emulate, on a vulgarized plane, the romantic comings and goings of the Fine Arts; there was nothing else for it to do. But while the highbrows could no doubt afford to let their fancy roam in the Trossachs and Lyonesse, the rest could



not so easily ignore the inartistic new chimneys and machinery which were shaping their lives. So life was shaped without the help of the Fine Arts, and without the help of architects. Some of the engineers, to be sure, did, and still do\* very well without them (none better than Paxton who succeeded in designing the first and only really popular modern building, acclaimed as the New Architecture by everyone except the architects). But the arts inhabited and still inhabit a high intellectual stratosphere and efforts to make them popular, whether by the balloon of popular education, or the parachute of highbrow condescension, are bound to fail. The Promenade concerts have not appreciably improved popular musical taste; and the jazzed-up classics (current number: "XVIII Century Drawing Room") mostly get castrated in the jazzing-up. The initiative must come from below, and there are signs of it already. The present position is artificial and by no means permanent—no more so than the social order, no more and no less.

We can look forward to a time when architecture will again be fine building, just as old manors and churches were "fine" cottages and barns. The New Architecture may or may not be a foretaste of this new vernacular (probably not, a better one is given in American films and ten-inch record music). But even if architects cannot anticipate events, they can demonstrate lines of inquiry, æsthetic, technical, and social. So far, this has been mostly an æsthetic movement with technical developments following behind. But even so, it differs from the rest of modern art movements (post-impressionists onwards) in not being merely an extension of those of the last century.

The last ten years have seen arrival at æsthetic maturity and technical mastery. Alfred Roth's opening words are: "This book is a contribution towards establishing the present state of the development of the New Architecture." This he does by providing an anthology of fastidiously selected buildings.† As in all anthologies, one can find faults of omission and commission. First, there are, for instance, no examples of German, Austrian, Polish, Spanish, or Russian work—perhaps on grounds of inaccessibility or technical incompetence—but there are five examples from Switzerland. Second, the inclusion of Sir Owen Williams's grand old warhorse, the Nottingham Factory is æsthetically inconsistent, though otherwise much to be applauded. Many have never before been published in this country; none so luxuriously. To look at and possess, it is a Rolls-Royce among books. Swiss typography is always good, but Max Bill has excelled himself here. The technical drawings are exceptional, but perhaps the most exciting single thing in the book is the photograph of the *Plaslaan* flats on page 703, which is guaranteed to proselytize the most fanatical reactionary. Here the New Architecture spreads its wings and flies.

TIM BENNETT

\* See Sir Owen Williams's contribution to the book under review.

† For purposes of record—since this is by way of being a definitive book—the twenty buildings selected by the author to represent the New Architecture's achievement may be noted. They are:—Kocher & Frey: *Weekend House* (U.S.A., 1934). Corbusier & Jeanneret: *Holiday House* (France, 1935). Frierberger: *Prefabricated Timber Houses* (Sweden). Haefeli: *Two country Houses* (Switzerland, 1932 & 1934). Roth, Roth & Breuer: *Two Apartment Blocks* (Switzerland, 1936). De Mars & Cairns: *Co-operative Farm Community* (U.S.A., 1937). Haefeli, Hubacher, Steiger, Moser, Roth, Artaria & Schmidt: *Neubühl Middle-class suburb* (Switzerland, 1932). Van Tijen, Maaskant, Brinkmann & Van der Vlugt: *Two working-class blocks of flats* (Holland, 1934 & 1938). Neutra: *Experimental School* (U.S.A., 1935). Beaudouin & Lods: *Open-air school* (France, 1936). Banfi, Belgioioso, Peressutti & Rogers: *Sun-cure Institute* (Italy, 1938). Haefeli & Moser: *Open-Air Baths* (Switzerland, 1939). Van Loghem: *Swimming Bath* (Holland, 1932). Boeken: *Sports & Exhibition Hall* (Holland, 1934). Sakaura: *Japanese Exhibition Pavilion* (France, 1937). Bill: *Swiss Exhibition Room* (Italy, 1936). Aalto: *Public Library* (Finland, 1935). Merkelbach & Karsten: *Broadcasting House* (Holland, 1936). Havlicek & Honzik: *Office Building* (Czecho-Slovakia, 1934). Sir Owen Williams: *Chemicals Factory* (England, 1932).

## Culture versus Craft.

ACADEMIES OF ART PAST AND PRESENT. By Nikolaus Pevsner. Cambridge: The University Press. Price 25s.

ACADEMIES of art first came into existence in Italy during the Cinquecento. Their formation marks the complete severance of art from the ideas which governed it during the Middle Ages. The ground was well prepared for this by the end of the Quattrocento when a new theory of art and a new conception of the rôle of the artist were already accepted by the great masters of the High Renaissance. Leonardo da Vinci, for example, in the "Libro della Pittura" claimed for the art of painting, a place among the *artes liberales*. To the medieval conception of art as a handicraft and the artist as a workman he opposed the ideas of art as a science and the artist as a man of social position. His aim was to separate art from craft. The painter was to be taught knowledge rather than skill. Michelangelo, who had grown up outside the bonds of medieval guild life, refused to be regarded as "a painter or sculptor such as made a business of it." According to Condivi he said he wanted noblemen, not plebeians, as pupils.

Leonardo and Michelangelo may be said to have destroyed the unity of art as a craft and art as a profession. Academic teaching took the place of workshop training. Art began to depend on a small select public of educated connoisseurs. As a result the artist lost in social security what he had gained in social status. The insecure bohemianism of the modern artist was already foreshadowed.

In form the organization of the academy was in harmony with a period which saw the evolution of the political idea of absolutism. It conformed with a belief in certain dogmas and canons of art derived from a few "divine" artists of the past.

The first academies—founded by Vasari and Zuccari—laid down the main lines on which art academies were to develop in the future. They were formed at a time when art was highly schematic and artists were utilizing in their work the compositions, figures, and details of great classic masters. The character and destiny of academies of art down to the twentieth century were thus largely determined from the start. But in the course of development academies leaned more and more towards a strict authoritarianism which reached its apex in France under Colbert. No academy was ever so powerful as the Paris *Académie Royale de Peinture et de Sculpture* which firmly established a reputation in the seventeenth century as the leading European body of its kind. Under Louis XIV the artist was regarded as a social necessity for the governing class whose power was in fact furthered by the Academy system. Anti-academic talents were severely discouraged.

The Netherlands, on the other hand, remained impervious to the influence of academies during the seventeenth century. In Flanders (at Antwerp, for example) there was still a live medieval tradition in keeping with the requirements of the day. In Holland the painter enjoyed complete freedom and worked in his studio for nobody in particular. This had its disadvantages. Some artists of reputation like Jan Steen, Aert Van der Neer, Van Goyen and Philips Koninck were obliged to have as a prop a second job besides painting.

At the end of the eighteenth century when it was fashionable for princes to emulate the cultural life of Versailles, art academies sprang up all over Europe. By this time however revolt was on the way. It broke out first in Germany where the artist Carstens declared that "All schools of painters, whether public or private, supported by patronage or individual contribution, were, and are, symptoms of art in distress. . . ." Voltaire and the Encyclopædists had previously pointed out that academies tended to foster pedestrian talent and to harm genius, and Voltaire's pupil Frederick the Great had refused to do anything for the Berlin Academy. The battle in Germany was joined in the field of *Weltanschauung*. In France, where the academic regime was also challenged by the most powerful artist of the period, David, it was fought in the field of practical policy. David favoured the formation of a "Commune des Arts."

"Genius" and "emancipation" were the watch-

words of the younger generation at the beginning of the nineteenth century. The artists of the Romantic Movement could not recognize any *raison d'être* for academies. Against them they hurled all the denunciations which in another age had been heaped on the guilds. Throughout the century there was a state of tension between the officially recognized art of the academies and experimental art of an anti-academic character. Belated changes took place when the academies were forced by irresistible developments to accept one innovation after another. Always however there was a time lag. Moreover, the artists of the nineteenth century no longer served state, society or public. The roots connecting their work with actual needs were completely cut.

New life was breathed into art education with the revival in Europe first of handicrafts and then of industrial art. For the first, William Morris and the English arts and crafts movement were largely responsible, but it was left to Germany to initiate a new scheme of art education in line with modern industrial and technical development. The German endeavours at the beginning of the present century, which found their most complete expression in the Bauhaus experiment at Weimar and Dessau, were directed by men who believed that architecture and design were more essential to the foundation of a twentieth century style than painting and sculpture.

Dr. Pevsner examines the education of artists during the last four centuries with scholarly thoroughness, and in the light of his conviction of the need for a social history of art which will consider the changing relationship between the artist and the world in which he lives. This extremely well documented book is a most valuable contribution to a part of the vast field which such a history would cover.

PERCY HORTON

## SHORTER NOTICES

THE STORY OF THE ENGLISH HOUSE. By Hugh Braun. London: B. T. Batsford. Price 10s. 6d.

THIS is a brief but clearly-written and well-illustrated survey of a popular subject, containing little information that is not readily accessible elsewhere but none the worse for that as the format is convenient. Mr. Braun is primarily an antiquarian—and a very good one, as his previous and really informative book on *Castles* showed. But the limitations of the antiquarian viewpoint are exposed in this book. Most antiquarians believe that architecture came to an end at the beginning of Queen Victoria's reign, but Mr. Braun is a little more realistically minded and adds a brief chapter called "Nowadays—a Post-script" to continue his story for another century. Alas, however, it is both facetious and sadly inadequate. The last century is after all the background of our own times and worthy of serious study even by people who cannot bring themselves to admire its achievements. It is very depressing to find books still being written that only regard it as a bad joke. Mr. Braun shows himself even more ignorant when he attempts to put modern architecture in its place. Again it is made merely a target for that facetiousness one finds so wearisome: "The Young Idea had of course to develop an 'ism.'" The religion they adopted was called "Functionalism," and was based, approximately, upon the theory that any building which could be made to stand up was All Right."

I WORE MY LINEN TROUSERS. By Basil Collier. London: J. M. Dent. Price 15s.

THIS unfortunate—indeed rather embarrassing—title conceals a very readable travel-book with a considerable amount of architectural and topographical observation. It is a brave thing to write a travel book about Provence and the *Côte d'Azur*, so overlaid have these regions become with the hackneyed impressions of innumerable writers. But Mr. Collier succeeds in looking even at Avignon with sufficiently fresh eyes and his autobiographical method, deliberately egocentric, insures that his text is a bit livelier than that of a guide-book. He writes easily and wittily; one's only complaint being that the passages of gratuitous historical information with which he interlards his personal journal are too little related to the whole, with the result that they are boring even when their subject is fascinating. They become lectures within a book, not part of the book itself.

# DECORATION



## Kitchen Storage

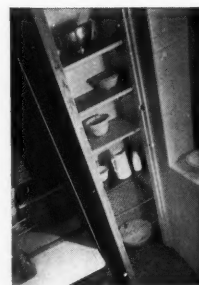
It is a truism that modern design entered the home by way of the kitchen ; that is to say, that a large part of the general public first learnt to appreciate what modern designers could do in the way of solving a problem both scientifically and elegantly by seeing it bring order to the chaos of the old-fashioned kitchen. In many houses the kitchen and the bathroom are still the best designed rooms, and in a wider sense than the merely functional. On the following pages the second of a series of articles on "Decoration as Storage" discusses the decorative opportunity offered to the architect by the necessities of kitchen storage. A good example of the sort of decorative quality that can be achieved is the above kitchen in a house by E. Maxwell Fry.



## Decoration as Storage

The series of articles of which this is the second are an attempt to examine the possible decorative use that can be made of one particular function of the interior, namely storage. It will be realized on reflection that it is not far from the truth to say that nearly the whole of interior architecture is concerned with the problem of storage. The designless home is that in which all the owner's possessions are heaped in a litter on the floor; the well-designed home is that in which each object has its appointed place; and the well decorated home is that in which the necessity of storing innumerable pieces of property is made the opportunity for an interesting sequence of shapes and patterns. The bedroom is as much dominated by the wardrobe and chest-of-drawers as by the bed; the dining-room as much by the china-cabinet as by the table; even the old-fashioned kitchen was dominated by that obsolete piece of furniture the dresser, while the modern kitchen often appears to consist of nothing but an array of cupboards from floor to ceiling and wall to wall.

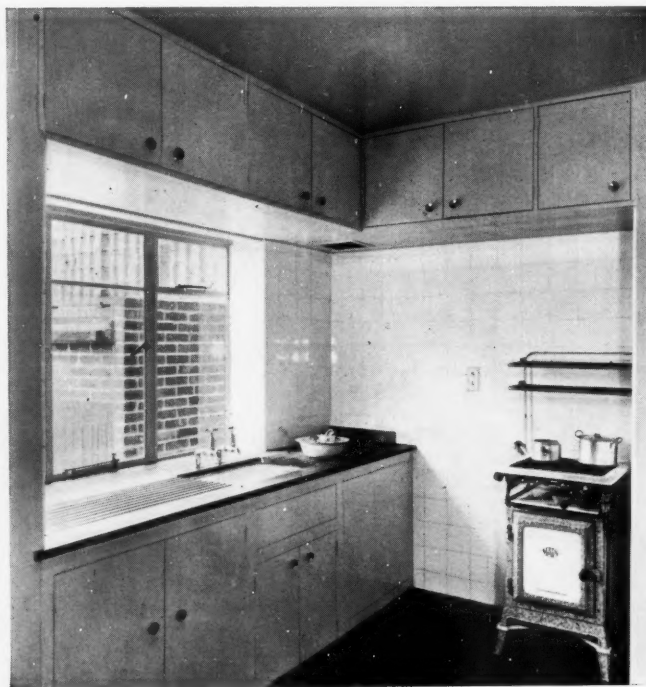
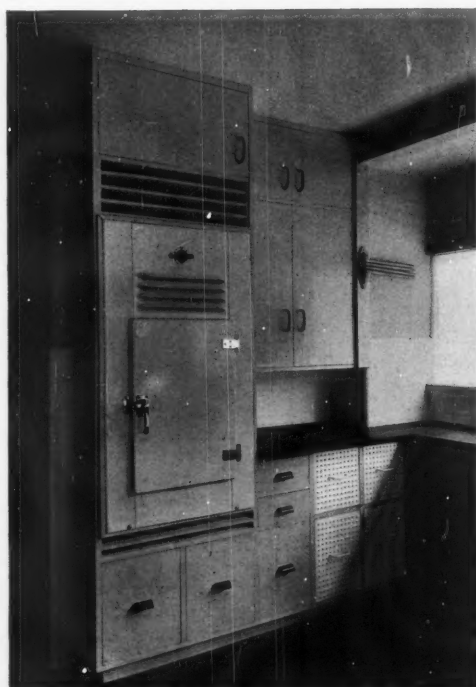
In these articles, by taking each object that has to be stored in turn, it is hoped to show what decorative effect the ingenuity of architects can extract from the efficient accommodation of it. Last month the heading was Books; this month it is Kitchen Storage—the accommodation of foodstuffs, utensils and other kitchen equipment. In the text Frederick Gibberd contributes some notes about the exact nature of the problems of kitchen accommodation from which the elegant and well-ordered interiors of the modern kitchen, as shown in the illustrations, originally derived.



## 2 KITCHEN STORAGE

Kitchen storage is divisible into three sections, namely, Food, Tools and Utensils and Cleaning Equipment, although in the modern compact kitchen these sections will overlap and will be fused with the working equipment into one design.

The food groups which require storage come under three headings: Eminently Perishable Food, Perishable Food and Dry Goods and Preserves. Eminently perishable foods such as meat, game, fish and milk, require a refrigerator. The one or two cubic foot model generally used in a minimum dwelling or low-cost house, is small and neat enough to be easily built in without dominating the other storage units. Such refrigerators may be stood on the floor and combined with the sink, draining board or cooking table, or possibly all three, forming one long horizontal unit and giving a continuous working height. Alternatively, they may be placed at eye level, with cupboards above and below. In either case only the door of the refrigerator tells in the design. With larger models, such as the five and six cubic foot capacities, one is always conscious of them as a major and dominating element. Some de-

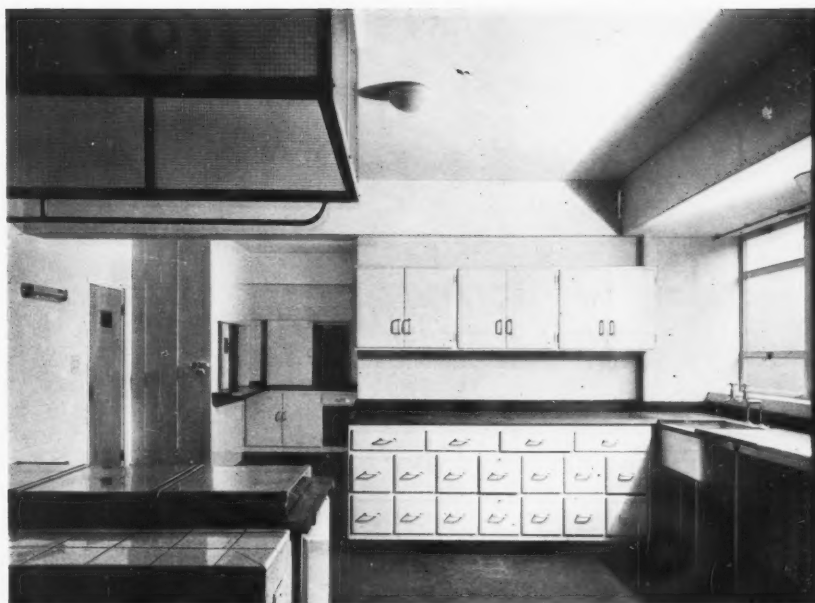


1, Flats at Sydenham (Frederick Gibberd, architect). Minimum larder in standard kitchen. 2, Flat in Cambridge (E. W. N. Mallows, architect). A refrigerator is beneath the shelf on the right, the tall cupboard on the left is for brooms and in the centre is a sliding hatch to the dining-room. 3, House at Grunewald, Berlin (Leo Nachtlitz, architect). Servery, surrounded by storage. In plywood, painted. 4, House in Hampstead (Connell, Ward and Lucas, architects). Refrigerator and food storage. 5, House in London (H. G. Swann, architect).





6



7

signers accept the situation and stand the refrigerator on legs in splendid isolation against a blank wall, but with careful handling it can be made an integral part of the main storage unit.

Thus in the kitchen on page 31, the refrigerator is cased in a wood framing, painted in with the other fittings, and is made to support the end of the hanging cupboards. Further, it encloses the working space between the top of the storage cupboards and the underside of the hanging cupboards, making a recess which is emphasized by the change in texture between the glazed tile facing on the back wall and the wood surfaces of the fitting.

A somewhat similar solution is shown on the facing page in 4. In this case the refrigerator is stood on drawer units, bringing it nearer to eye level to avoid stooping, and ventilating grilles are introduced. The basis of the design is that of a deep L-shaped fitting enclosing a shallow hanging one and a working space.

Perishable goods such as cakes, bread, potatoes, and apples, which will remain fresh for some days between purchase and consumption, are generally kept in a larder. The traditional type of larder is virtually a small room with window at one end, door at the other, and shelves down the sides. Today, there is a tendency to store less and less perishable food because the shops

have fresh supplies daily, the family is smaller, and the variety and quality of tinned goods has improved, and the larder has become a shallow ventilated cupboard. A typical larder which is supplementary to a refrigerator is shown in 1. It is so shallow that no window is required and everything can be seen at a glance. The shelves are 16 in. deep and are as follows: wire for vegetables, slate for overflows from the refrigerator, and wood for general storage.

In many kitchens equipped with a refrigerator the desire to obtain a continuous sequence of working operations has resulted in the larder being dissolved into various cupboards and drawers round the room. Thus it is common to find vegetable racks near the draining board, flour hoppers above porcelain-enamelled cook's table, and air-tight metal drawers for bread and cake near the service hatch.

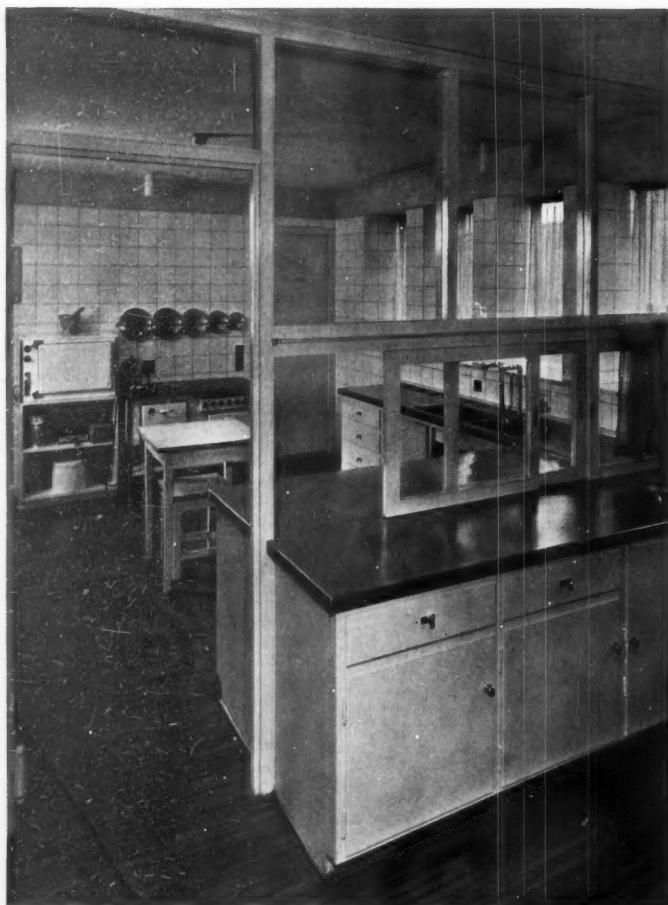
There is a wide variety of "Cook's Cabinets" on the market, with all kinds of ingenious devices for storing the dry goods; and for those who prefer to design their own, simple glass or pottery canisters are obtainable, or a standard nest of glass drawers may be slung from the underside of a cupboard, as in 8.

Bottled fruits, jams and other preserves which are put away for the winter can be accommo-



8

6, Flat in St. John's Wood (Marshall and Tweedy, architects). Metal sink, electric clock, radio, refrigerator and tradesmen's telephone are all built in. 7, Girls' hostel in Gower Street (E. Maxwell Fry, architect). Storage cupboards forming partition between cooking and serving portions of kitchen. 8, House at Esher (Christian Barman, architect). Kitchen storage incorporating service hatch.



9

dated in the least accessible parts of the kitchen. In 5 a range of cupboards is hung from the ceiling for this purpose. The depth in this case is rather great, possibly for the formal reason of lining up the face of all the cupboards in the same plane. Shelves for preserves should not be more than two pots deep, otherwise the rear pots will be difficult to get at.

The various tools and utensils are disposed about the kitchen near to the units with which they operate. The dresser is, of course, the traditional storage place for the services and glass used for the dining table, and some designers still recognize the decorative value of china and glass and expose it to view, not on open shelves as in the old Welsh dresser, but behind glass doors, which if running direct in tracks without a wood frame still give the same brilliance but with the additional protection against dust.

The china store may be in the form of a large battery of cupboards separating the kitchen from the dining-room, as in 12. In this position they will form an efficient sound insulator owing to the air space enclosed between the two skins, and will allow the inclusion of a service hatch. Double doors are, of course,

required to the latter; on the dining side these should slide and on the kitchen side they can either slide up and down, as in 8, or be hinged at the bottom to form a flap, as in 12. Silver drawers under the hatch can be made to pull out into both rooms.

As the plate rack is a small unit and can make a wall look untidy it is sometimes combined with another fitting. In 11, for example, the rack is incorporated in the long horizontal cupboard.

Apart from separating the kitchen from the dining-room storage units can be planned to divide up the kitchen working space; for example, in 10, a hanging china cupboard provides a screen between the kitchen and scullery, in 9 the pot cupboards and cutlery drawer units, with their glazed screen above, separate the kitchen from the service room, and in 7 a large kitchen is divided into cooking and preparation compartments by a battery of cupboards.

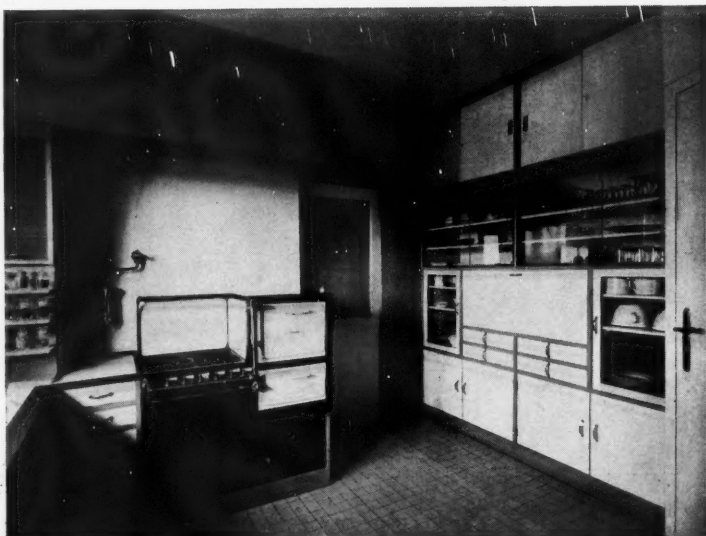
The general household cleaning equipment is usually stored in the kitchen, requiring a tall cupboard, as in 6. The dust trap under the sink is invariably enclosed by cupboards which may be used to store the "charging" equipment. Heating pipes under the cupboard will dry out the cloths and pans.



10



11



12

9, Flat in Copenhagen (Skjot Pedersen, architect). Kitchen divided from scullery by cupboards with glazed screen above. 10, House at Prague (Adolf Bens, architect). Cupboard and shelving behind sink are common to both kitchen and pantry. 11, House at Poole (Oliver Hill, architect). White paint-work and tiled walls to window-head level. 12, House at Brunn, Czecho-Slovakia (Bohuslav Fuchs, architect).



# The Individualist Speaks

What is most striking in London is its vastness. It is the illimitable feeling that gives it a special character. London is not grand. It possesses only one of the qualifications of a grand city, size; but it wants the equally important one, beauty. It is the union of these two qualities that produced the grand cities, the Romes, the Babylons, the hundred portals of the Pharaohs; multitudes and magnificence; the millions influenced by art. Grand cities are unknown since the beautiful has ceased to be the principle of invention. Paris, of modern capitals, has aspired to this character; but if Paris be a beautiful city, it certainly is not a grand one; its population is too limited, and, from the nature of their dwellings, they cover a comparatively small space. Constantinople is picturesque; nature has furnished a sublime site, but it has little architectural splendour, and you reach the environs with a fatal facility. London overpowers us with its vastness.

Place a Forum or an Acropolis in its centre, and the effect of the metropolitan mass, which now has neither head nor heart, instead of being stupefying, would be ennobling. Nothing more completely represents a nation than a public building. A member of Parliament only represents at the most the united constituencies; but the Palace of the Sovereign, a National Gallery, or a Museum baptized with the name of the country, these are monuments to which all should be able to look up with pride, and which should exercise an elevating influence upon the spirit of the humblest. What is their influence in London? Let us not criticize what all condemn. But how remedy the evil? What is wanted in architecture, as in so many things, is a man. Shall we find a refuge in a Committee of Taste? Escape from the mediocrity of one to the mediocrity of many? We only multiply our feebleness, and aggravate our deficiencies. But one suggestion might be made. No profession in England has done its duty until it has furnished its victim. The pure administration of justice dates from the deposition of Macclesfield. Even our boasted navy never achieved a great victory until we shot an admiral. Suppose an architect were hanged? Terror has its inspiration as well as competition.

Though London is vast, it is very monotonous. All those new districts that have sprung up within the last half-century, the creatures of our commercial and colonial wealth, it is impossible to conceive anything more tame, more insipid, more uniform. Pancras is like Mary-le-bone, Mary-le-bone is like Paddington; all the streets resemble each other; you must read the names of the squares before you venture to knock at a door. This amount of building capital ought to have produced a great city. What an opportunity for Architecture suddenly summoned to furnish habitations for a population equal to that of the city of Bruxelles, and a population, too, of great wealth. Mary-le-bone alone ought to have produced a revolution in our domestic architecture. It did nothing. It was built by Act of Parliament. Parliament prescribed even a façade. It is Parliament to whom we are indebted for your Gloucester Places, and Baker Streets, and Harley Streets, and Wimpole Streets, and all those flat, dull, spiritless streets, resembling each other like a large family of plain children, with Portland Place and Portman Square for their respectable parents. The influence of our Parliamentary Government upon the fine arts is a subject worth pursuing. The power that produced Baker Street as a model for street architecture in its celebrated Building Act, is the power that prevented Whitehall from being completed, and which sold to foreigners all the pictures which the King of England had collected to civilize his people.

In our own days we have witnessed the rapid creation of a new metropolitan quarter, built solely for the aristocracy by an aristocrat. The Belgrave district is as monotonous as Mary-le-bone; and is so contrived as to be at the same time insipid and tawdry.

Where London becomes more interesting is Charing Cross. Looking to Northumberland House, and turning your back upon Trafalgar Square, the Strand is perhaps the finest street in Europe, blending the architecture of many periods; and its river ways are a peculiar feature and rich with associations. Fleet Street, with its Temple, is not unworthy of being contiguous to the Strand. The fire of London has deprived us of the delight of a real old quarter of the city; but some bits remain, and everywhere there is a stirring multitude, and a great crush and crash of carts and wains. The Inns of Court, and the quarters in the vicinity of the port, Thames Street, Tower Hill, Billingsgate, Wapping, Rotherhithe, are the best parts of London; they are full of character: the buildings bear a nearer relation to what the people are doing than in the more polished quarters.

BENJAMIN DISRAELI

[*Tancred, or The New Crusade, 1847*]

## The Oxford Survey.

The members of the Royal Commission on Historic Monuments are probably tired of being informed by their critics that Queen Anne is dead and that architecture did not fail to continue after her death in 1814. And they are probably also tired of protesting that it is their terms of reference that prevent them taking notice of any building done after this date. It would presumably need an Act of Parliament to revise the terms of reference, but one is led by the recent publication of the Royal Commission's volume on Oxford to observe that there have been many less useful Acts of Parliament.

Oxford without its buildings of the eighteenth century and after is so unthinkable that it is not surprising to find oneself regarding this volume as the final demonstration of the Historic Monuments Act's shortcomings, and one notices that for the first time the compilers, obviously realizing the ludicrousness of their position, have stretched a point and made passing reference to several eighteenth-century buildings such as the Bodleian and Worcester College. But in the illustrations such dominating elements of Oxford's architecture as the Bodleian and the Taylorian only appear by accident in the background of photographs of mediaeval remains. And the whole balance remains absurdly wrong.

One does not mind about this so much on account of the book itself—there is nothing wrong about an antiquarian book on pre-Hanoverian Oxford, although one dealing with the whole of Oxford architecture would be more interesting. Why one does mind about it is because of its effect on uninformed opinion. The book's prefix of "Royal" and its official status generally give it an authority which it can only use to confirm such people as City Councillors in their already strong antiquarian prejudices. Oxford is a place that has already suffered a lot from the destruction of architecture that does not happen to possess the sanctity of extreme old age—witness, for example, the cases of Beaumont Street and the Clarendon recently publicized in these pages—and now when the vandals lay their fingers on more of eighteenth-century Oxford and those who mind about it protest, they will be answered with the triumphant proof that "it can't be worth retaining: it isn't in the Royal Commission's list of historic monuments."

## The Black-out Problem Anticipated.

The drawing reproduced on the next page appeared in one of the exceedingly popular *Comic Almanacs* which George Cruickshank produced over a number of years about a century ago. It is given here as it illustrates one particular problem, inherent in the use of large plate-glass windows, that the lighting restrictions these days have aggravated. But Cruickshank, of course, was chiefly satirizing the fashion for using plate glass indiscriminately as a form of display. For the forties of last century saw the sudden commercial success of this new



## THE BLACK-OUT PROBLEM ANTICIPATED



The Height of Improvement - putting up the Shutters

From Cruickshank's "Comic Almanack" for 1843

material which in a few years changed the appearance of every shopping street from the modest sequence of small-paned bay windows that we associate with the Georgian scene to the strips of sheer glass that the town shop-front means to us today.

Cruikshank's drawing is accompanied by two pages of doggerel verse in which the fashion for plate glass is satirized in the rather facetious style that early Victorian humourists often indulged in. One stanza of the verses reads as follows:

If shop enlargement should proceed  
Beyond its present height,  
Some new invention we shall need  
For shutting up at night.  
The mania did begin  
In building palaces for selling gin;  
But the infection's regularly caught  
By tradesmen now of every sort:  
We soon shall see  
Tripe from gilt columns hung,  
Or sausages festooned and slung  
From cornices of richest filigree;  
Liver, illumined by the strongest lights,  
Will tempt the passer-by at nights;  
In mirrors, whose reflection  
Is skilfully on all sides thrown.  
For general inspection  
Hap'orths of cats' meat will be shown.

## CORRESPONDENCE.

### Alton Towers.

The Editor,

THE ARCHITECTURAL REVIEW.

Sir,

Mr. R. P. Ross Williamson, in his delightful article on Alton Towers in your May issue, mentions Abraham and Fradgley as the artists employed by the 15th Earl of Shrewsbury to lay out and adorn the estate. He rightly adds that "there were probably others as well." I happen to have a note of who three of these others were which you may think it worth publishing. The information is abstracted from the biographical articles in the Architectural Publication Society's Dictionary:

Thomas Allason (1790-1852) "designed additions to the mansion and was engaged in laying out the gardens."

Thomas Hopper (1775-1856) is credited with "works at Alton Towers," about 1820.

J. B. Papworth (1775-1869) is credited (by his son, the editor of the Dictionary) with "the bridge of seven arches, the conservatory, the

Grecian and Gothic Temples, garden seats, the Foundations of the pagoda, etc.," in 1818-22.

The article on Abraham says that "conjointly with his son" he was responsible for "conservatories and garden buildings" and gives the date as 1824.

I wish I knew how to distribute the many charming things at Alton among these four worthy claimants. I am inclined to give the excessively clever Greek conservatory to Papworth rather than to Abraham, but apart from that I will venture nothing. Some of your readers will doubtless know that Allason was responsible for the fine lay-out of the Ladbroke estate in West London; while Hopper's reputation rests substantially on the Prince Regent's prodigious Gothic conservatory at Carlton House.

Yours etc.

JOHN SUMMERSON.

London, N.W.3.

### Railings for Scrap.

The Editor,

THE ARCHITECTURAL REVIEW.

SIR,

The Iron and Steel Control are making a survey of iron railings, etc., throughout the country. I understand that Works of Art are excluded. This shows an awakening of conscience on the part of a public body which is as refreshing as it is unusual. An article entitled "Sell your old Iron" in the *Canterbury Diocesan Notes* for April 1938 has come to my notice, however, and I send you a copy. It leads one to believe that the Church is not so concerned with handing on its sacred trust. Without commenting on questions of decency regarding the treatment of the graves of the faithful departed, which might have been assumed to be immune for any attack from this quarter, I would point out that the article, advocating the removal of the iron railings from our churchyards, is based upon the insecure foundation of the Taste of the Moment.

Taste is a dangerous thing. It varies from one generation to another and has a vast amount of senseless destruction to its name. Taste robbed us of multitudes of fine screens; countless examples of post-Reformation church furniture, fittings and benches. Taste mutilated the interior arrangement of most of our cathedrals, while churches throughout the land bear the scars of wounds inflicted by the pursuit of ideals of the moment or the "Popular Style" of the day. The list is not complete but the moral is clearly seen. Taste cannot be trusted. The follies committed in its name cause us to smile. It is ever so, but are we really so very much better?

Few people in this generation will miss these railings and few hands will be raised in their defence, but there is a small body who are capable of appreciating good design even if it is dated in the early or mid 19th century. If these railings are destroyed England will have lost a small part of its history, and future generations will hold fingers of scorn at those who instituted this wanton destruction.

The iron railings around memorials in our churchyards are not as numerous as the writer of the article suggests, nor are they, except in certain cases, of poor design; in fact the reverse is

often the case. There is great variety in the design of angle posts and their finials and many interesting types of small urns and railing tops are to be seen. The various architectural expressions of the period find an echo—Robert Adam, Neo-Grec, Soane and Gothic Revival are all to be found. The railings form a definite link in the evolution of English design and are relics expressing the condition of the society which raised them.

Yours etc.,

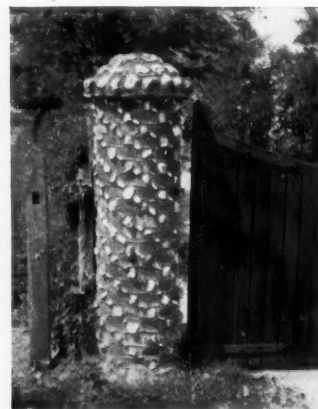
GEORGE G. PACE.

East Croydon.

[The paragraph from the *Canterbury Diocesan Notes* to which our correspondent refers, reads as follows:

"It may be worth noting that many of our Churchyards contain tons of old iron railings which are of considerable value today. These ugly railings which have disfigured our Churchyards for several generations are a most objectionable relic of the 18th and 19th centuries and they ought to be removed. They were erected in times of rank individualism when there were doors to the High Pews, when people were placed in church according to the order of social precedence and when they died the Church's walls were plastered with their memorials and their graves were made externally secure by impregnable prison bars. Some Churchyards are to this day disfigured by a forest of these iron monstrosities. Why preserve these impregnable defences when no one wishes to dishonour the old bones of our Georgian Squires? Far better sell them for the defences of the country which is open to attack by real enemies, and if not attacked no harm will have been done: the old ugly railings will have gone and a nice little sum may have been acquired for making the Churchyard a beautiful garden of spring flowers and summer roses."

Readers who are aware of the destruction of fine Georgian box-pews that has gone on recently in our country churches will not fail to notice that in the above paragraph "objectionable railings" are attributed to the time when "there were doors to the high pews." To the clerical mind the eighteenth century is still anathema. EDITOR.]



An article on pages 9-14 of this issue deals with local materials, and Mr. MacQuedy's "Criticism" article on page 27 discusses how modern architecture is setting about re-using them. Here is an example of how not to do it, from a seaside villa in West Sussex. Flints are stuck into a red cement gatepost in an attempt at a pattern that lacks any relation to the nature of the material. Compare the characterless proportions and modelling of the cap with those of the gate-post illustrated on page 10.

All timber swells more or less as it absorbs moisture, and shrinks again as it dries, but in Teak the rate of absorption is so low and the movement so minute that in practice it need not be considered at all.

For all exterior joinery there is no wood like Teak, particularly for such difficult jobs as large folding and sliding doors, which may be exposed to the weather on one side and central heating on the other. When made in Teak such doors will not 'cast' through swelling and shrinking, but will always slide easily in their track; they are not too heavy to be easily operated; and they always look well, whether bright varnished or left to weather naturally.

Practical experience confirms tests carried out at the Forest Products Laboratory, Princes Risborough:

	Teak	Oak
Radial Shrinkage (green to air-dry)	1.2%	2.7%
Tangential Shrinkage " "	2.2%	7.6%
Time required to raise moisture content by 3% when exposed to 90% humidity	11 days	7.5 days

#### WAR-TIME SUPPLIES OF TEAK

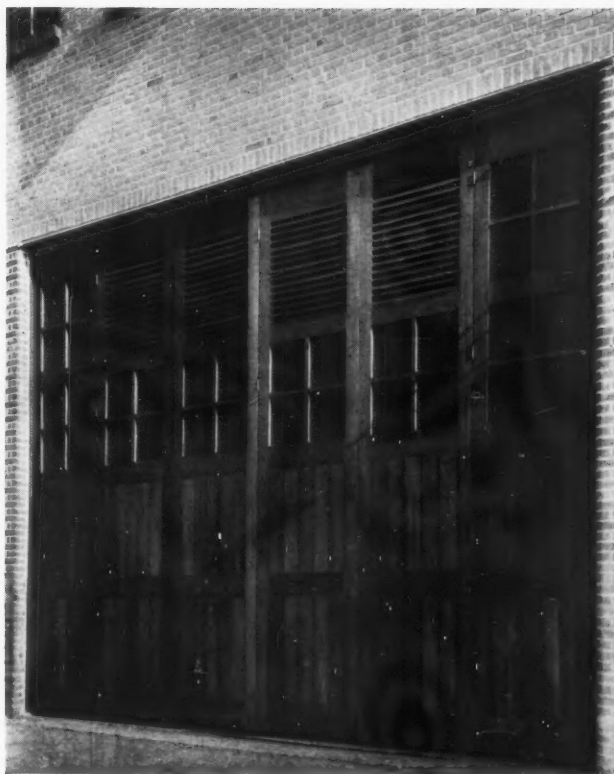
Teak is officially recognised as an essential war-time import. Ample supplies are available and the price remains moderate.



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## Teak—Tectona grandis

The only true Teak is Tectona grandis. (See the recently issued "British Standard Nomenclature of Hardwoods" on this point.) Beware of other so-called "teaks." These woods are not TECTONA GRANDIS and therefore are not Teak. They do not possess the properties of Teak.

# BURMA TEAK

Stoneham & Kirk



**The Animal Frieze at  
Johannesburg.**

Mr. Walter Gilbert, the sculptor responsible for the decorations on the Anglo-American Corporation of South Africa's new building at Johannesburg, which was illustrated in THE ARCHITECTURAL REVIEW for May, asks for the following additional acknowledgments to be made :

Donald Gilbert was associated with him in the work, especially in connec-

tion with the animal frieze. The latter illustrates the indigenous fauna of South Africa, and the sculptors were assisted by the advice of Mr. David Seth-Smith, Curator of Mammals and Birds, Zoological Society of London, Capt. Guy Dollman, Assistant Keeper of Mammals, British Museum of Natural History, and Lt.-Col. Sir Ronald Waterhouse, the big-game hunter. These authorities visited the studios and approved the whole work before it was dispatched to South Africa.

George Churchill, North of England School Furnishing Co., Finmar, Ltd. (furniture), Gordon Russell, Ltd. (curtains), John Lewis & Co., Ltd. (curtains and carpets), Tidmarsh and Sons (window blinds), Triplex Foundry (cooking—solid fuel), Samuel Parkes & Co., Ltd. (school equipment).

**Lakeside Café, Battersea Park.**

**Architect :** H. A. Rowbotham.

The general contractors were Burnand and Pickett, Ltd. Among the sub-contractors were the following : Permanite, Ltd. (asphalt roof), British Reinforced Concrete Eng. Co., Ltd. (B.R.C. fabric in foundations), Sussex & Dorking Brick Co., Ltd. (hand-made sand faced multi-coloured facings), H.B. Concrete, Ltd. (art stone), Measures Bros. (1911), Ltd. (structural steel), W. Briggs and Sons, Ltd. (roofing felt to verandah), Modern Surfaces, Ltd. (patent cement wall glazing), North British Rubber Co., Ltd. (rubber flooring to café), Veronese, Ltd. (Terrazzo floor to verandah), Great Metropolitan Flooring Co., Ltd. (composition flooring to kitchen and lavatories), Gas Light and Coke Co., Ltd. (gasfitting), Standard Metal Window Co. (metal casements and doors), British Plaster Board, Ltd. (plaster boards to ceilings ("Thistle")), Stie B. Paint Sales, Ltd. (decorative plaster), Stockall, Marples & Co., Ltd. (clocks).

# The Buildings Illustrated

**New High School for Girls,  
Richmond, Yorkshire.**

**Architect :** Denis Clarke Hall.

The general contractors were George Dougill and Sons, Ltd. Among the sub-contractors were the following : Northern Asphalt & Roofing Works, Ltd. (roofing covering), Joseph Kaye and Sons, Ltd., Henry Hope and Sons, Ltd., Dryad Metal Works, Ltd. (door and window furniture), Ideal Boilers & Radiators, Ltd. (lavatory basins, radiators), Baldwins (Birming-

ham), Ltd. (w.c. and sinks; taps), Alpine Window Co. (window control gear; wood windows), Graham Bros., Ltd. (electrical installation), Matthew Hall & Co., Ltd. (heating and ventilating), Bratt Colbran & Co., Ltd. (electric fires), Hewitt Engineering Co., Ltd. (boilers), Lensecrete, Ltd. (glass concrete construction), Haywards, Ltd. (patent roof glazing), Gypsum Mines, Ltd. (Sirapite—special plaster), May Acoustics, Ltd. (acoustic plaster), Sissons Bros. & Co., Ltd. (concrete paint), Wm. Harland and Son (paint), Walpamur, Ltd. (distemper),

## Small Accounts

By tradition as well as by deliberate policy, the Westminster Bank has always aimed at fostering the 'small' account. Moreover, there is no sharper line of demarcation between 'big' and 'small' than between 'white' and 'black'; there are many greys between, and it has always been good business for the Bank to encourage the smaller account, with confidence in its growth later on.

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